

**APPENDIX**  
**EXHIBITS (Pages 1381-1876)**

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**Supreme Court of the United States**

OCTOBER TERM, 1973

No. 72-402

UNITED STATES OF AMERICA,

*Appellant*

—v.—

GENERAL DYNAMICS CORPORATION, THE UNITED  
ELECTRIC COAL COMPANIES, and FREEMAN  
COAL MINING CORPORATION

ON APPEAL FROM THE UNITED STATES DISTRICT COURT  
FOR THE NORTHERN DISTRICT OF ILLINOIS

JURISDICTIONAL STATEMENT FILED SEPTEMBER 8, 1972  
PROBABLE JURISDICTION NOTED DECEMBER 11, 1972



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A REPORT

TO THE FEDERAL POWER COMMISSION

Prepared by

THE WEST CENTRAL

REGIONAL ADVISORY COMMITTEE





1381

# **WEST CENTRAL REGION**

## **POWER SURVEY**

**1970-1990**



**A REPORT**  
**to the FEDERAL POWER COMMISSION**  
**prepared by**

**THE WEST CENTRAL**  
**REGIONAL ADVISORY COMMITTEE**

# SUMMARY

The West Central Region comprises about one-fifth of the conterminous United States and includes about 14% of the population. The region is outlined on the map, Figure 1, below.

Figure 1



The region extends from Lake Michigan and the Illinois-Indiana state line on the east to an irregular line through eastern Montana, Wyoming and western Nebraska. In the north-south direction, the area extends from the Canadian border to an irregular mid-continent line including most of Nebraska, northern Missouri and all of Illinois. The West Central Region corresponds to FPC power supply areas 13, 14, 15, 16, 17 (excluding the Kansas city area), 26, 27, 28 and 40.

The principal load centers are located in the eastern half of the region, and are concentrated in the metropolitan areas of Chicago, Milwaukee, Minneapolis-St. Paul, Omaha, Des Moines, Quad Cities and St. Louis. The western portion of the region is an area of low population density and corresponding low load requirements with few major load centers.

The non-coincident peak load for 1965 in the West Central Region was 24,290 megawatts and the projections are 35,930 megawatts for 1970, 70,610 megawatts for 1980, and 131,680 megawatts for 1990 as detailed in the following tabulation. This indicates a load in 1990 of about five and one-half times the 1965 load compared to an anticipated population growth of 40 percent. The total energy used per person is expected to increase from 4,800 kwhr in 1965 to 18,500 kwhr in 1990.

Figure 2  
LOAD GROWTH IN THE WEST CENTRAL REGION  
(MEGAWATTS)

PSA Area	1965	1970	1980	1990
13	3,344 (W)	4,660 (W)	8,510 (S)	15,290 (S)
14	6,733 (S)	10,070 (S)	19,810 (S)	37,020 (S)
15	2,943 (S)	4,530 (S)	9,720 (S)	18,770 (S)
16	2,984 (W)	4,280 (S)	9,210 (S)	18,350 (S)
17	2,471 (S)	3,730 (S)	7,160 (S)	13,120 (S)
26	649 (W)	960 (W)	1,820 (W)	3,390 (W)
27	627 (W)	910 (W)	1,900 (W)	3,680 (W)
28	1,444 (S)	2,220 (S)	4,390 (S)	8,070 (S)
40 (Excl. EEInc)	2,529 (S)	3,835 (S)	7,355 (S)	13,255 (S)
40 (EEInc only)	566 (W)	735 (W)	735 (S)	735 (S)
Total (Non-coincident)	24,290	35,930	70,610	131,680
Total (Non-coincident summer season)	23,920	34,830	69,780	130,240

(S) denotes summer peak

(W) denotes winter peak

The task force based these load projections on a pooling of the independent judgments of the utilities in the region. This current forecast for the region as a whole is higher than that appearing in

the 1964 National Power Survey. As an example, the 1980 forecast of 70,610 mw compares with the previous forecast of 61,050 mw, an increase of about 15%. The principal reason for this increase is the continued rapid growth in the economy and growth in utility sales and peak loads during the period subsequent to the 1964 National Power Survey effort.

Substantial fossil fuel resources are located within the region, with approximately 370 billion tons of recoverable coal reserves believed to exist. Additionally, a recent report indicated additional reserves could amount to 225 billion tons of recoverable coal reserves in unmapped and unexplored areas. Although the bituminous coal resources have made a considerable contribution to the supply of electric energy to date, the sub-bituminous coal supply in Montana and Wyoming and the lignite coal reserves in the Dakotas and Montana are receiving new attention with the advent of unit-train transportation and improved burning technology. As a matter of interest, one county in North Dakota contains 71 billion tons of lignite coal. This is the largest tonnage for coal bearing counties in the nation.

The natural gas reserves in the region comprise less than 1% of the total reserves in the United States. The crude oil and natural gas liquid reserves approximate 2% of the total liquid hydro carbon reserves in the United States.

The fossil fuel survey indicated that the average price of coal f.o.b. mine has increased about 10% for coal obtained from Illinois, the highest producing coal area in the region, during the period 1961-1966. Rail transportation has predominated in the movement of coal in this region, and within recent years the cost of coal transported by rail has been reduced substantially on selected movements of coal shipped by unit train. During 1966 about 22% of coal for the region was shipped by unit train, 27% by rail-barge, and 11% by rail-lake.

Large investor-owned utilities are the principal suppliers of electric energy to the major metropolitan centers in the eastern portion of the region. Rural electric cooperatives are well established throughout the entire region and the generation-transmission type (G & T) cooperatives are functioning in Iowa, Minnesota, North Dakota, South Dakota and Wisconsin. Public agencies are the principal suppliers of electric energy in Nebraska. The largest numbers of municipal systems in the region are found in PSA 17 (188), PSA 28 (138), and PSA 16 (110).

In the West Central Region there are 85 investor-owned systems, 261 cooperatives, two Federally-owned systems, and 701 publicly owned systems, comprised mainly of municipal systems and public power districts. Investor-owned companies serve 83.8 percent of the energy requirements in the region, the cooperatives 2.6 percent and the public agencies (other than Federal) 6.9 percent. The Federal Government generates 6.7 percent of the electric energy in the region, its output being sold principally to municipalities, public power districts and cooperatives. In 1965 about 38 percent of all the power generated by G & T cooperatives in the United States was produced in the West Central Region with cooperatives in PSA 16 alone accounting for about one-half of this amount.

The five largest of the 85 investor-owned electric systems supply nearly 60 percent of the electric loads in the region. Commonwealth Edison Company of Chicago alone accounts for about 27 percent and Union Electric Company of St Louis for about 11 percent of the regional load. The largest municipal system in the region is Springfield, Illinois, which had a peak load in 1967 of 170 megawatts or about one-half percent of the total regional load.

Public power districts are the principal suppliers of electric power in Nebraska. Many towns in the state are served by municipal systems. Some of the municipalities provide their own generation but most obtain their power from public power districts which carry out the principal generation and transmission functions in the state. Public power districts and cooperatives in Nebraska are also the principal agencies for the distribution of power. There are no investor-owned utilities providing electric service in Nebraska.

The Bureau of Reclamation is the marketing agency for hydro-electric power from Federal projects located in the Missouri River Basin. The power is marketed largely to customers having preference under Federal Law, i.e., municipal systems, public power districts and cooperatives, over a transmission network which generally has a voltage of 230 kilovolts. Numerous wheeling arrangements have been made by the Bureau with utilities in the area for delivery of power to such preference customers.

There is a total of 1,049 electric systems serving the region. With the exception of 71 isolated systems comprising .57% of the total service, all the systems are interconnected and operate in parallel with the vast majority of electric utilities in the United States. By 1970, the interconnecting transmission system will be overlaid with a 345 kv transmission system in the eastern



half of the region and an overlaying EHV system in the western half will have been begun. The pattern of transmission development anticipates that the 345 kv system in the eastern half will be substantially augmented during the 1970-1980 period and a 765 kv system will have been started. In the western half of the region the transition to a 500 kv system will be initiated. By 1990, several east to west 765 kv transmission lines are anticipated with their extension through western Minnesota, the Dakotas and the state of Nebraska at 500 kv to interconnect with the western systems.

Consideration of probable increasing fossil fuel costs, increasing concern for air pollution, fossil fuel transportation difficulties, and the anticipation of relative decreasing nuclear fuel costs with the development of fast breeder reactors have resulted in a considerable emphasis on nuclear generating plants. Although about 90% of the electric energy produced in the region is presently supplied by fossil-fuel generation, by 1990 nuclear generating capacity is anticipated to comprise 57% of the region's capacity. Nuclear generation is expected to supply nearly 70% of the region's energy requirements by that time. While the quantity of coal burned annually is indicated to increase from 51 million tons in 1966 to 69 million tons in 1975, the regional use of coal apparently will remain relatively constant at about 65 million tons for the remainder of the study period.

Generating capacity of 79,832 megawatts is projected by 1980 to supply a non-coincident summer peak of 69,780 mw with a reserve of 15.6%. By 1990, generating capacity of 151,041 megawatts is projected to cover a non-coincident summer peak of 130,240 megawatts reflecting a reserve of 16.6%. An importation of 800 mw of hydro power from Canada is included in each of these reserve calculations. Additional reserve of an undetermined amount exists because of the diversity of load between utilities within the season. About half of the 1990 capacity is shown to be in units of 800 megawatts or larger. Generator unit size up to 2000 megawatts and total plant size up to 4000 megawatts are included.

There are six power pools within the region and three major regional coordinating groups. These organizations permit the coordination of planning of transmission and generation and the coordination of operating these facilities. Such coordination is made possible through the direct work of committees and task forces comprised of representatives of individual utilities on the pool level, and of representatives of pools and areas on the regional level. Two offices have been established to provide coordination of hour-to-hour and day-to-day operations.

Additionally, liaison established with contiguous regions provides continuity in the development of interconnections at the boundaries of these organizations and in the operating of mutually-affected facilities. As further coordination develops in increasing depth, it is anticipated that a single regional coordinating organization will evolve with the major planning and operating responsibilities being carried on by five area-wide groups. The interworking between these five groups then will be coordinated within the one principal organization.



## II

## INVENTORY OF FOSSIL FUEL RESOURCES

## INTRODUCTION

The purpose of this report is to update the 1964 National Power Survey, Vol. II, Advisory Committee Report No. 21 on Fuels for Electric Generation, prepared by the Fuels Special Technical Committee.

In updating Report No. 21 we have not attempted to change or modify the extensive and authoritative background material in that report, which represents the best advance thinking on industry fuel problems by some of its foremost members. Instead we have supplemented that report where changes have occurred in the price of fuel, the cost of transportation and methods of transport.

The West Central Region fossil fuel reserves are reported in detail by individual counties in each state. The reserves are tabulated by class of reserves as to whether they are "measured," "indicated" or "inferred" and by thickness of the coal beds. Measured reserves are those for which tonnage was computed from direct measurements. Indicated reserves are those for which tonnage was computed partly from specific measurements and partly from responsible assumptions based on available data and geologic evidence. Inferred reserves are those for which quantitative estimates are based on a broad knowledge of the character of the bed or the region, but for which there are few, if any, actual measurements. This detailed information on coal reserves should be useful to system planners in selecting future sites for large thermal power plants.

Other task force committees have prepared reports on load projections, types of generation, air pollution and nuclear power; therefore, this report does not include information on those subjects. If the reader desires information on productive capacity of the coal industry, future projected prices of various fuels or other related information regarding fuels, it is suggested he consult the report of Fuel Resources, Requirements and Costs for Electric Generation in the Eastern United States which was prepared by a committee that included representatives from the Federal Power Commission, the Bureau of Mines and the Office of Oil and Gas, Department of the Interior.



## SUMMARY

During the period 1970-1990, electric generation will be dependent upon five basic forms of energy -- coal, gas, oil, hydro, and nuclear. This report is concerned primarily with fossil fuels. The availability of approximately 370 billion tons of recoverable coal reserves in the West Central Region is more than sufficient to meet the electric utilities' requirements in this region through the year 2000. A recent report indicates additional reserves in this region could amount to 225 billion tons of recoverable coal reserves in unmapped and unexplored areas.<sup>1</sup> Coal, however, will be faced with continuing pressures from other forms of energy, and based on present trends the most significant competition will be from nuclear energy.

Mechanization and handling of coal at the mine will continue to improve. Some of the new developments in underground mining in recent years have been the use of a mobile bridge conveyor which has increased the productivity from a continuous miner substantially, the underground push button miner, the installation of long wall mining equipment, and the application of computer simulation techniques.

In determining the type of fuel to be used for electric generation a number of factors have to be reviewed and evaluated, each of which will have a bearing on total fuel costs for any one location. The cost of transportation, anti-air pollution devices, storing, handling and disposing of the fuel product are economic factors which can make a low cost fuel the most expensive fuel. Therefore, while a general picture can be drawn of the availability and price of fuels, the final determination in selecting a fuel or fuels for a particular plant must be based on the specific facts pertinent to that plant and its location.

A fossil fuel survey questionnaire was sent to twenty-six electric utilities which consume approximately 90 percent of the coal used for electric generation in the West Central Region. The questionnaire inquired as to producing district, tonnage burned, f.o.b. mine price, average BTU per lb. received, cents per million BTU f.o.b. mine, methods of transportation used, freight rate, haulage distance, and tonnage per shipment.

This survey indicated that in the period 1961-66 the average price of coal f.o.b. mine has increased from 15.03 to 16.57 cents per million BTU or an increase of 10.18 percent on the coal obtained

1. Averitt, Paul, 1968 U.S. Geological Survey.

in District 10. (36 million tons of 46 millions tons reported for the region). The average annual increase in the cost of District 10 coal in the five year period 1961-1966 amounts to 1.9 percent per year. Due to the less significant tonnages reported in relationship to tonnage produced, a comparison of the price increases for coal obtained from other districts is not shown.

Rail transportation in the past has predominated in the movement of coal in this region, and within recent years the cost of coal transported by rail has been reduced substantially on selected movements of coal shipped by unit train. Based on the 46 million tons reported in the survey for the year 1966, approximately 10 million tons, or 21.8 percent, were shipped by unit train, 12,200,000 tons, or 26.6 percent, were shipped by rail-barge, and 5,280,000 tons, or 11.5 percent, were shipped by rail-lake. The amount of coal shipped by conveyor and captive shuttle train during the period 1970-1975 will increase by 11,000,000 tons versus a 7,000,000 ton increase for unit train shipments.

The average rail freight cost in the West Central Region for coal shipments in 1966 amounted to \$1.97 per ton on a tonnage of 23,500,000 tons, or approximately 46 percent of the coal consumed in this region. The unit train freight rates reported in the survey when compared on a basis which considers railroad ownership of all equipment indicates that the mills per ton mile range from 10.3 mills per ton mile for an 85 mile haul to 7.2 mills for a 138 mile haul and down to 5.0 mills for a 355 mile haul.

Past projections indicated that unit train freight rates could level out at a cost of 4 mills per ton mile for hauls between 350 miles and 600 miles.<sup>2</sup> However, no hauls of 400 to 500 miles at 4 mills were reported. The inability of the utilities to obtain a lower cost than 5 mills per ton mile is partially substantiated by the fact that as of the present date between now and 1975 approximately 10,000 megawatts of nuclear capacity is planned or considered for installation in the West Central Region.

In the five year period 1961-1966 the consumption of gas for thermal electric generation increased from 0.223 to 0.260 trillion cubic feet or at an average annual rate of 3.11 percent compared to a 7.73 percent average annual increase in coal consumption in the same period. The average cost of gas for the region in the same period increased from 25 to 25.3 cents per million BTU or by 1.2 percent.

2. 1964 National Power Survey, Vol.2, Advisory Report No. 21, Pg. 333

Table A, page II-5, indicates the electric generation produced by coal fired plants in the West Central Region will increase from 124.8 billion Kwh in 1970 to 155.3 billion Kwh in 1990 and nuclear generation will increase from 17.5 billion Kwh to 489.1 billion Kwh in the same period. Table B, page II-5 indicates coal consumption will increase from 60.4 million tons in 1970 to 65.7 million tons in 1990.

Table 1, page II-11, lists the remaining coal reserves in the West Central Region by percent sulfur content and approximately 72.7 percent of the reserves in the region contain 1.0 percent or less sulfur. However, most of these low sulfur coal reserves are located in the States of Montana and North Dakota and most of the coal consumed in the region is obtained from the State of Illinois.

Table 2, page II-12, indicates the coal consumed for electric generation in the West Central Region in 1966 had an average sulfur content of 2.8 percent which is slightly more than the 2.3 percent average sulfur content of all coal consumed by the electric utilities in the United States.

The growing demand for air pollution abatement regulations has contributed to a major shift from the use of coal for electric generation to nuclear energy. In the West Central Region in 1966 approximately 72 percent of the electric generation was produced in coal fired plants and 1 percent by nuclear plants. Present projections illustrate that by 1990 approximately 22 percent of the electric generation in the region will be produced in coal fired plants and 70 percent by nuclear plants.

The natural gas reserves in the West Central Region as of December 31, 1966 amounted to 1.33 trillion cubic feet or less than one percent of the total reserves in the United States. Based on the projected United States cumulative natural gas requirements for the period 1966 to 1990 of 680 trillion cubic feet the reported reserves of this region could supply only 0.20 percent of these requirements.

The oil consumption in the West Central Region represented less than one percent of the total fuel consumption for the region. The crude oil and natural gas liquid reserves in the region amount to 0.813 billion barrels or approximately 2 percent of the total liquid hydrocarbon reserves in the United States.

In the State of Illinois as of July 1, 1965, the latest revised estimates of coal remaining in the ground totaled 140,700 million



tons in reserves, of which 63,900 million tons are classed as measured and indicated and 76,800 million tons as inferred, all of which is of bituminous rank. The reserves are well distributed over an area of 38,000 square miles or 67 percent of the State's area in 78 counties of the 102 counties in Illinois. The minimum thickness of coal considered in preparing this estimate was 28 inches, except for areas of strippable coal where an average thickness of 18 inches was used.

Coal seams in Illinois are at depths ranging from a few feet to several hundred feet below the surface. Ages ago, the coal bearing formations were downfolded into a huge spoon-shaped basin centered in the southeastern part of the State. As a result, the beds minable by underground methods lie at the center of the basin while along the outer rim in a total of 40 counties, approximately 19,000 million tons of strippable coal lie near enough to the surface to be recovered by strip mining.

Tonnage figures alone, however, cannot demonstrate the full importance of Illinois coal reserves. The thickness of the beds is also extremely important since this aspect has a bearing on mining methods and, therefore, productivity. Most of the remaining coal reserves are in coal beds thick enough to permit effective mechanical mining.

The estimated original coal reserves of Iowa total 7,236 million short tons, of which 3,500 million tons are classed as measured and indicated reserves and 3,735 million tons are classed as inferred. A total area of about 1,316,040 acres in 37 counties was included in the reserve calculations; an additional area of about 1,291,830 acres in 44 counties is indicated by the currently available information to be favorable for the presence of coal beds more than 14 inches thick. The total recorded coal production of Iowa through 1963 is about 356 million tons. Assuming that for each ton of coal produced another ton has been made unrecoverable, the remaining reserves of the State are about 6,524 million tons.

Past estimates of the coal resources of Iowa were highly generalized and were based solely on an assumed total area underlain by coal of potential economic interest and on an assumed average thickness of coal within that area. The estimate of Campbell and Parker (1909), the most frequently quoted, of 29,160 million tons included coal 14 inches or more thick in an area of 12,560 square miles. The present detailed estimate by Landis (1965) is smaller than the older generalized estimates and covers a much smaller area. This estimate of Iowa coal reserves is on a bed-by-bed



original reserve basis. The ratio is about one-fourth as much reserves in about one-sixth as much area.

About one-third of Missouri is underlain by bituminous coal-bearing strata, and coal has been mined in 55 of the 63 counties in which it occurs. Coal deposits occur in an area of some 24,000 square miles extending northeastward across the State from Jasper County to Clark County. The estimated original coal reserves of Missouri total 23,977 million tons.

In the years since the Hinds (1912) estimate of 79,393 million tons was made, stratigraphic studies have indicated that many of his correlations of coal beds were in error and that the persistence in thickness which he assumed cannot be demonstrated in many localities. Coal beds thin and thicken from one area to another and in many instances in very short distances. An additional factor of considerable importance in the area north of the Missouri River is that glacial drift occupies the position of coal beds in many places. Details of this relationship can be established only by drilling or mining but, in general, considerable areas are affected.

A re-evaluation of Missouri's original (before mining) coal resources was made by Searight (1966) on a county-by-county basis. Current information does not support the large resources indicated by Hinds, and these have consequently been adjusted downward. In some cases, only 10 percent of the previous estimate has been retained, and others have been cut to as little as one percent of the earlier estimate. The total tonnage represented in the present estimate of 23,977 million tons is less than one-third that of 1912 estimate figures. The total cumulative tonnage mined in the period 1840 through 1967 has been approximately 313 million tons. The coal remaining is, therefore, estimated to be approximately 23,335 million tons.

The original coal reserves of Montana total 222,047 million tons as estimated by Combo and others (1949). This estimate includes 2,363 million tons of bituminous coal, 132,151 million tons of subbituminous coal, and 87,533 million tons of lignite. The reserves were estimated according to standard procedures of the U.S. Geological Survey with several minor exceptions as follows: for bituminous coal the thickness categories used were 14 to 24 inches, 24 to 36 inches, and more than 36 inches, instead of the standard categories of 14 to 28 inches, 28 to 42 inches, and more than 42 inches, which were established after the Montana work was underway. For subbituminous coal and lignite standard categories of 2½ to 5 feet, 5 to 10 feet, and more than 10 feet were used.

The Montana coal fields cover 35 percent of the total area of the State. Reserves are present in 35 out of 56 counties, but are concentrated largely in the Fort Union region and the Powder River Basin in the eastern part of the State. Big Horn, Powder River, and Rosebud Counties alone contain more than half the total in the State. For the past several years considerable exploration has been conducted by mining and petroleum companies and currently (April 1967) revised estimates indicate the presence of deposits of strippable reserves totaling about 8 billion tons.

The original lignite reserves of North Dakota, as estimated by Brant (1953), total 350,910 million tons of which 9,522 million tons are classed as measured, 50,120 million tons as indicated, and 291,268 million tons as inferred. The reserves were estimated according to the standard procedures of the U.S. Geological Survey. All the lignite included in the estimate is less than 1,200 feet below the surface and about 70 percent of the total reserves are less than 500 feet below the surface.

The reserves are well distributed over an area of 28,000 square miles in 23 counties in the western half of the State. Of several counties with large reserves, Dunn County is conspicuous in containing 71 billion tons or about one-fifth of the State total. This is also the record reserve tonnage for coal-bearing counties in the United States.

The original lignite reserves of South Dakota, as estimated by D. M. Brown (1952), total 2,033 million tons, all of which is less than 1,000 feet below the surface. The reserves were estimated according to standard procedures of the U.S. Geological Survey. The lignite reserves are concentrated in six counties in the northwestern part of the State. Harding County contains nearly 84 percent of the estimated reserves, but most of past production has been obtained from Dewey and Perkins Counties.

## INVENTORY OF FOSSIL FUEL RESOURCES

During the period 1970-1990, electric generation will be dependent upon five basic forms of energy -- coal, gas, oil, hydro, and nuclear. This report is concerned primarily with fossil fuels. The availability of approximately 370 billion tons of recoverable coal reserves in the West Central Region as shown in Figure 1 and listed in Table 1 are more than sufficient to meet the electric utilities' requirements through the year 2000. Coal, however, will be faced with continuing pressures from other forms of energy, and based on present trends the most significant competition will be from nuclear energy.

In determining the type of fuel to be used for electric generation a number of factors have to be reviewed and evaluated, each of which will have a bearing on total fuel costs for any one location. The cost of transportation, anti-air pollution devices, storing, handling and disposing of the fuel product are economic factors which can make a low cost fuel the most expensive fuel. Therefore, while a general picture can be drawn of the availability and price of fuels, the final determination in selecting a fuel or fuels for a particular plant must be based on the specific facts pertinent to that plant and its location.

During the past twenty years the coal industry has contributed a great deal to the stability of fuel prices. Mechanization of the mines has enabled the industry to either reduce or at least maintain within reasonable limits the price of its product, in spite of continuing increases of over-all price indexes. During the period 1970-1990 it is expected that there will be continuing improvement in the mechanization and handling of coal at the mine. Some of the new developments in underground mining in recent years have been the use of a mobile bridge conveyor which has increased the productivity from a continuous miner substantially, the underground push-button miner, the installation of long wall mining equipment, and the application of computer simulation techniques.

Although coal is available in sufficient quantities in the West Central Region to supply the entire energy requirements of the electric utilities in this region, competition will determine the extent to which coal will penetrate each market.

temperature to 86°F. Cooling towers are included in the design of two large nuclear plants presently under construction in anticipation of state agency temperature limitations of 86°F. for mixed water or 5° over ambient. Capital costs for cooling facilities to date are estimated at \$10,000,000 for plants totaling 2700 megawatts.

One utility in the area is constructing a 20 megawatt plant utilizing a recently developed air cooled condenser. This plant is to be a prototype for larger plant installations now under consideration. Because this type of facility eliminates the need for large quantities of cooling water, it may provide greater freedom in the siting of moderate size generating facilities.

In addition to state and local agencies, the Air Quality Act of 1967 introduces a new factor. The Secretary of Health, Education, and Welfare is to designate air quality regions and issue criteria and control technology documents. The governors of states involved will have approximately nine months to draw up standards acceptable to HEW and another six months to establish a method of control for the region. Additional research and development of control technology is being funded under the Air Quality Act, but to date the control strategies commercially available to the utilities are largely the use of precipitators and high stacks.

The concern of Wisconsin companies for proper and effective control of air and water pollution has been expressed by the formation of an active task force on air and water criteria. This task force, which is sponsored by the Wisconsin Utilities Association, has been working with the Wisconsin State Department of Natural Resources to provide the Department with data on the problems of establishing adequate criteria for the control of air and water pollution. This task force has provided the Department with information on studies being conducted by a number of Wisconsin utilities. It is hoped that the results of these studies will provide the industry with knowledge that can be used to properly assess the degree and consequence of water and air pollution.

The problem of air pollution weighs heavily in the choosing of generation sites, the type of fuel used, the capital costs of equipment to maintain acceptable conditions, and ultimately on what the cost to the customer will be. The future will remain uncertain until air quality and emission standards are defined more clearly and equipment for reducing sulfur emissions is developed and becomes available commercially.

## IV

## COORDINATED PLANNING AND DEVELOPMENT

## I. Structure of the Industry

Fifty-one interconnected systems currently generate approximately 95% of the energy consumed through electric utility service in the West Central Region. Table I below provides 1967 data as to number and size of these major utilities in the various ownership segments of the industry. This group generally can be described as consisting of those systems providing virtually all of the high voltage system facilities in this region.

Table I

Type of Ownership	Utilities	Non-Coincidental Peak Load (MW)	Gen Cap (MW)	Energy Prod (1000 MWH)
Investor-owned	25	22 954	26 032	118 566
Rural electric G&T cooperatives	19	1 657	1 382	5 646
State	6	1 461	1 120	4 226
Federal	<u>1</u>	<u>746</u>	<u>2 048</u>	<u>9 692</u>
	51	26 818	30 582	138 130

1967 load and capacity data for the individual major utilities in each ownership segment are shown in Appendix A.

In addition to these major utilities there are about 1000 other utility entities involved in generation and/or distribution of electric energy. These are identified as to type of ownership, size and general location in Appendix B.



## II. Trends in the Development of Coordination Mechanisms

At present, nine coordinating organizations function within the region as follows:

Wisconsin Public Service Corporation-Wisconsin  
Power and Light Company-Madison Gas and Electric  
Company Pool  
Wisconsin-Upper Michigan Systems  
Illinois-Missouri Pool  
Iowa Pool  
Mid-America Interpool Network  
Mid-Continent Area Power Planners  
Missouri Basin Systems Group  
Nebraska Public Power System  
Upper Mississippi Valley Power Pool

Coordination areas of these organizations are shown in Figures 1-3. Appendix C presents first a brief summary and then detailed information on each body and its structure, purposes, and activities.

It is emphasized that there are no particular discontinuities in the pattern of interconnections at the boundaries of these organizations. Numerous other interconnection agreements and inter-relations exist that provide mechanisms for liaison and continuity in coordination across the region as demonstrated by the examples enumerated below:

1. MAIN and MAPP have overlapping membership with eight utilities being members of both of these organizations. This liaison arrangement is deemed particularly desirable for close coordination in planning and operation along the recently completed Twin Cities-Milwaukee-Chicago-St Louis-Twin Cities 345 kv loop. Operation of this loop and all other interconnecting transmission lines, and those otherwise mutually affected, is provided through established operating committees, through system simulation operating studies, and through continuous liaison between the respective coordination offices. The studies consist of current year operating studies, transfer capacity studies, and extreme disturbance studies. The areas of coordinated planning are handled through the planning arms of each of the organizations. Much of the planning is based upon

the aggregate load and capability forecasted and includes not only consideration of new facilities but also the future use of the interconnecting transmission facilities and power transactions to effect optimal use of generating equipment.

2. MAPP and MBSG liaison on projects of mutual interest is handled through the Intersystem Coordinating Committee. This committee was established by the respective organizations in 1965. Prior to the establishment of the MAPP Coordination Office and the associated Coordinating Committee, the Intersystem Committee organized an interim task force to review relay operating practices to assure that relaying of mutual interest would provide a reliable operation. Progress has been slow in the area of joint planning of transmission and generation and the committee itself has recently proposed that its parent organizations reconsider its membership and better define its responsibilities in the interest of improving progress.
3. All members of the Iowa Pool and UMWPP belong to the MAPP organization and have thereby broadened their capabilities in the traditional pooling activities of coordinated planning of generation and transmission, including power transactions, and coordinated operation of generation and transmission including short and long term maintenance scheduling, economy energy interchange, voltage profiles, automatic under-frequency load shedding, and dispatching procedures. This broadening comes about through the overview afforded in considerations of the Planning Committee which is geographic in its representation and through participation in the Coordinating Committee associated with the Coordination Office.
4. All members of the Wisconsin Power Group and Illinois-Missouri Pool belong to the MAIN organization.
5. MAPP-MAIN-UMVPP-Iowa Pool liaison, together with USBR participation in the MAPP Coordination Center, has resulted in development of an extensive teletype communication system permitting broad area coordination on day to day operating matters.

The area is presently served by three teletype

systems, all of which employ rented telephone company facilities. Cost sharing varies in each of the three systems ranging from equal shares to formulas using both number and size of systems involved. Teletype stations are located in the dispatching offices of the participating systems and the coordination centers. Use is limited to exchange of operating information and weather information.

The present systems are:

- MAIN 15 terminals - 5 in Wisconsin, 4 in Illinois - 2 in Minnesota (MAPP & NSP), 2 in Missouri (UE & AEC), 1 in Little Rock, Arkansas (SCEC) 1 in Canton, Ohio (AEP ECAR)
- UMVPP 10 terminals - 1 in North Dakota, 1 in South Dakota, 6 in Minnesota, 1 in Wisconsin, 1 in Iowa
- USBR 1 in South Dakota
- IOWA POOL 10 terminals - 2 in Minnesota (MAPP & NSP), 7 in Iowa, 1 in St Louis, Missouri (UE)

The UMVPP and Iowa Pool systems will be replaced in April 1969 by one MAPP system containing 25 terminals. This will include the present terminals plus new terminals for other MAPP members and adjacent utilities. The system will be comprised of 2 terminals in North Dakota, 6 terminals in Minnesota, 2 in Wisconsin, 2 in South Dakota (including USBR), 8 in Iowa, 2 in Nebraska (OPPD and CPPD), and 3 in Missouri (UE, St Joseph L&P and KCP&L). The MAPP system will utilize 100 wpm teletypes under the control of an automatic polling device located in the MAPP Center. All transmission will be by punched tape except during emergencies when an emergency override will permit manual transmission. Cost sharing will be according to a formula intended to recognize size of systems, mileage between adjacent terminals, and benefits accruing equally regardless of size.

6. As planning of specific facilities reaches a point in progress where the coordinating organization is agreed on the basic function and design, the participating utilities are represented on a number of task forces having responsibility for design, contractual arrangements, and use. The task force membership straddles organizational lines and provides further opportunities for coordination of associated facilities.

### III. Projections of Future Coordinating Requirements

The following discussion of possible future organizational arrangements among electric utilities is in reference to the fifty-one systems identified in Section I as providing 95% of the electric service in the region. It is, of course, recognized that corporate consolidations will very likely reduce the number of separate entities in the future. However, there is no basis for predicting the specific patterns or timing such consolidations may follow other than a general reference to those already announced to be under study.

By 1970, MAPP intends to increase the coordination among the various parts of the MAPP organization, including the Iowa Pool, the UMVPP, and its Nebraska members by developing a super-pool agreement. This consolidation will result in these five sub-regional systems remaining as workable coordinating entities within the West Central Region:

- Commonwealth Edison Company
- Eastern Wisconsin Utilities (including the Upper Peninsula)
- Illinois-Missouri Pool (including Central Illinois Light Company)
- Mid-Continent Area Power Planners
- Missouri Basin Systems Group

Each of these systems will exercise primary responsibility for planning and operation within their area, particularly with respect to economic matters.

With regard to reliability-oriented coordination, MAIN would continue with its present inter-pool operation in the eastern part of the region. Reliability-oriented coordination for the western portion of the region is expected to be provided by the recently executed Mid-Continent Area Reliability Coordination Agreement either expanded to include MBSG members

or through liaison arrangements with a separate MBSG reliability group.

Future patterns of generation and transmission developments prepared by the WCRAC contemplate 765 kv and 500 kv transmission lines across the region in the 1980's. These lines will provide capacity for meaningful power exchanges on a region-wide basis and also increase the interdependency among systems, particularly with respect to reliability. It is therefore proposed that a single West Central Reliability organization be established by 1980. In view of the large number of systems involved, manageability considerations dictate an interpool-type organization such as MAIN with the five above-identified area systems as members.

The foregoing material relating to future coordination patterns has been presented at meetings of the MAIN, MAPP and MBSG organizations in an effort to solicit views of utilities not represented on the WCRAC.

#### IV. Problems and Solutions

Operation of an electric power system is a complex matter involving the consideration of innumerable electrical elements and many people. Taken as a whole, the configuration changes from season to season, from day to day, and from hour to hour. To operate all of the interconnected electrical systems within a region in a truly coordinated manner becomes a tremendously complex matter requiring knowledgeable people, the necessary equipment and communications for the required overview, and of equal importance a strong desire on the part of all of those so engaged. That this coordination can be accomplished, and must be accomplished, is fully appreciated and has been taken on as a challenge of considerable substance by the utilities in this region.

It is recognized that the true strength of the operation is in the local knowledge of each area's needs and the resources available to supply these needs. The requirement then is for a coordinating effort which will supply the involvement necessary to do the job but which will not unnecessarily interfere in operations that can be adequately handled locally. Furthermore, it cannot be expected that a coordinating effort can be arbitrarily overlaid on the existing operation. Instead a coordination evolution is required which will gradually develop the capability of the coordinating organization and, in turn, the confidence of the participating systems with a resultant



growing willingness to accept the decisions and judgement of the coordinating personnel and to encourage their efforts.

Within the West Central Region there are variations in the nature of systems and load densities across the region producing differences in coordination problems and requirements. For example, a relatively few systems along the eastern edge of the region (Eastern Wisconsin Utilities, Commonwealth Edison, and the Ill-Mo Pool) generate almost 60% of the region's requirements while serving 15% of its area. As a result, pooling and interconnection arrangements appropriate for this area are markedly different than those applicable to the large number of systems serving the remainder of the region. Many types of utilities are represented with varying characteristics including that of size and of financing within the major groupings. Because of the hour-to-hour vital need to have a reliable operation, the coordinated operation of these systems has proven to be an endeavor not significantly affected by this dissimilarity. In the area of planning, substantial strides have been made in coordinating planning of both generation and transmission. As previously noted, only MAPP and MBSG have yet to fully coordinate their efforts. This situation is recognized by both organizations and is under active consideration.

#### V. Interregional Coordination

There are two formal arrangements for interregional coordination identified as such. These are the liaison arrangement between MAIN and ECAR, and MAIN and MAPP membership in the National Electric Reliability Council. Beyond these there are numerous bilateral interconnection agreements and other established channels for coordinated planning and operation with electric systems in adjacent regions.

The USBR has membership in both the Western Systems Coordination Council (WSCC) and the MAPP Coordination Committee and MAPP operating representatives attend WSCC operating meetings. These arrangements, along with those inherent within the USBR, provide liaison with the west lying region.

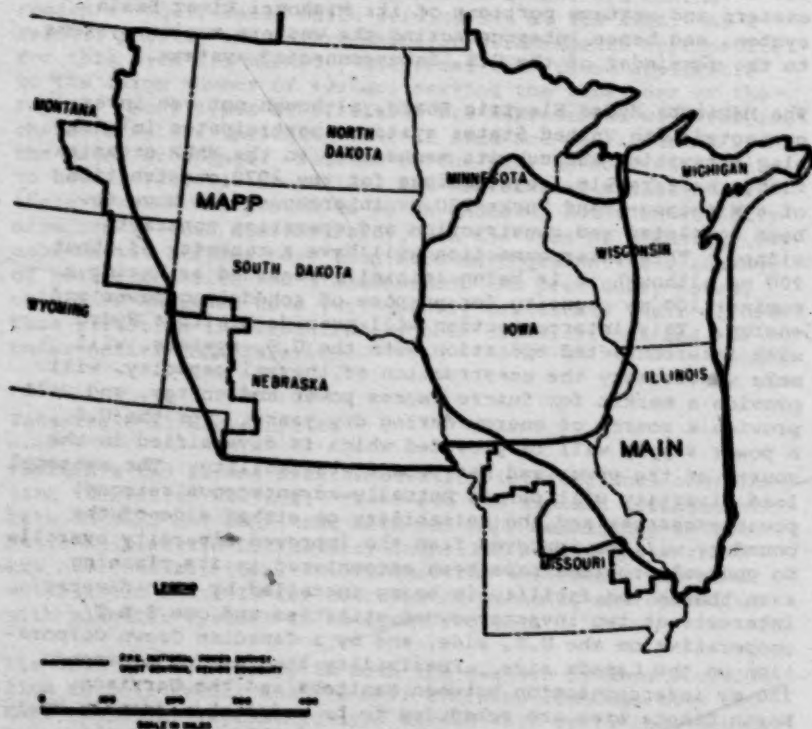
Some multi-system coordination activities involving other regions are: The MIO Agreement among Commonwealth Edison and five major utilities in Indiana and Michigan, which, among other returns, resulted in system performance studies in depth which included Commonwealth Edison Company as a participant and enveloped the eastern portion of this region.

The Twin Cities-Kansas City 345 kv Coordinating Agreement among four MAPP members and Kansas City Power and Light Company and St Joseph Light and Power Company in the South Central Region, which provides for the exchange of power and energy with the aim of optimizing the utilization of generation and bettering reliability. And the East-West Tie Closure Task Force, which was formed for the express purpose of studying the feasibility of and the procedures for closing the Bureau of Reclamation ties between the eastern and western portions of its Missouri River Basin system, and hence interconnecting the western region systems to the remainder of the U.S. interconnected systems.

The Manitoba Hydro Electric Board, although not yet interconnected with United States systems, participates in planning activities through its membership in the MAPP organization. As a result, negotiations for the 1970 construction of a Winnipeg-Grand Forks 230 kv interconnection have now been completed and construction and operating contracts signed. This interconnection will have a capacity of about 200 mw although it is being initially regarded as having a nominal 100 mw capacity for purpose of scheduling power and energy. This interconnection will provide Manitoba Hydro with interconnected operation with the U.S. systems, will make unnecessary the construction of thermal capacity, will provide a market for future excess power and energy, and will provide a source of energy during dry years. For the U.S., a power supply will be provided which is diversified in the source of the power and has prompt availability. The seasonal load diversity will permit mutually advantageous seasonal power exchanges and the reliability on either side of the boundary will be improved from the improved diversity overall. No unusual problems have been encountered in its planning even though the facility is being installed by such diverse interests as two investor-owned utilities and one G & T cooperative on the U.S. side, and by a Canadian Crown Corporation on the Canada side. Feasibility studies for a second 230 kv interconnection between Manitoba and the Garrison, North Dakota area are scheduled to be undertaken jointly by Manitoba Hydro and a number of MAPP and MBSG members.

## WEST CENTRAL REGION

## COORDINATION AREAS

MID-CONTINENT AREA POWER PLANNERS-MID-AMERICA INTERCONNECTED NETWORK

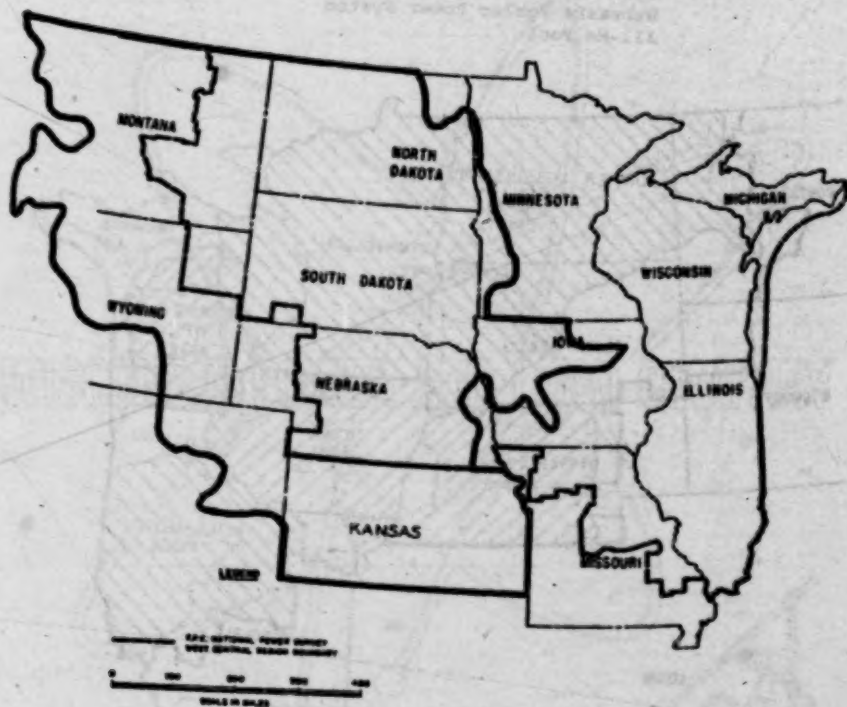
NOTE: Boundaries indicate general areas and do not necessarily include all systems within an area.

Figure 1

1407

WEST CENTRAL REGION  
COORDINATION AREA

MISSOURI BASIN SYSTEMS GROUP



NOTE: Boundaries indicate general areas and do not necessarily include all systems within an area.

Figure 2

IV-10

# WEST CENTRAL REGION OPERATING AREAS

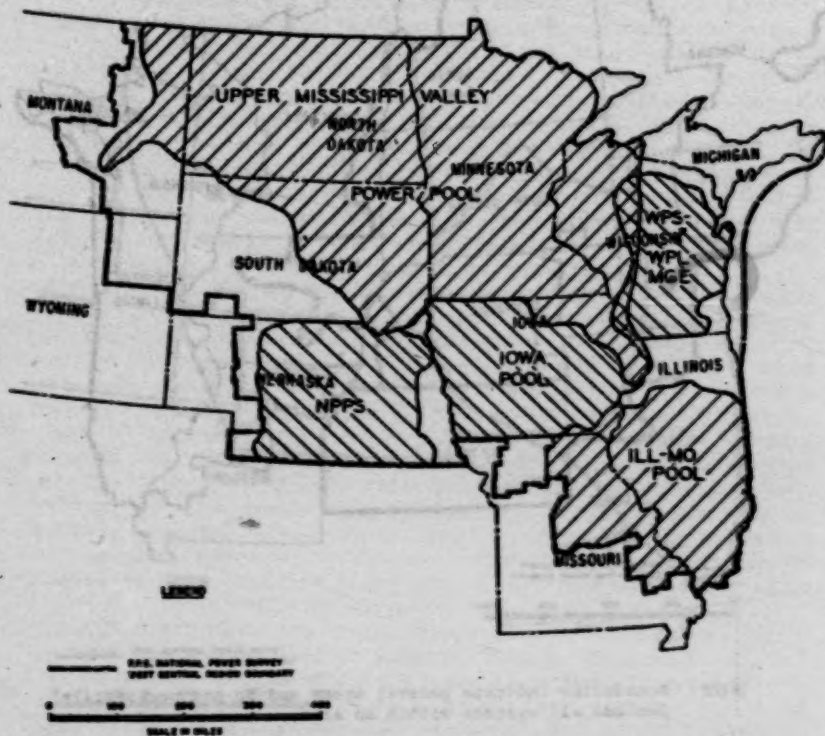
Upper Mississippi Valley Power Pool

WPS-WPL-MGE Pool

Iowa Pool

Nebraska Public Power System

Ill-Mo Pool

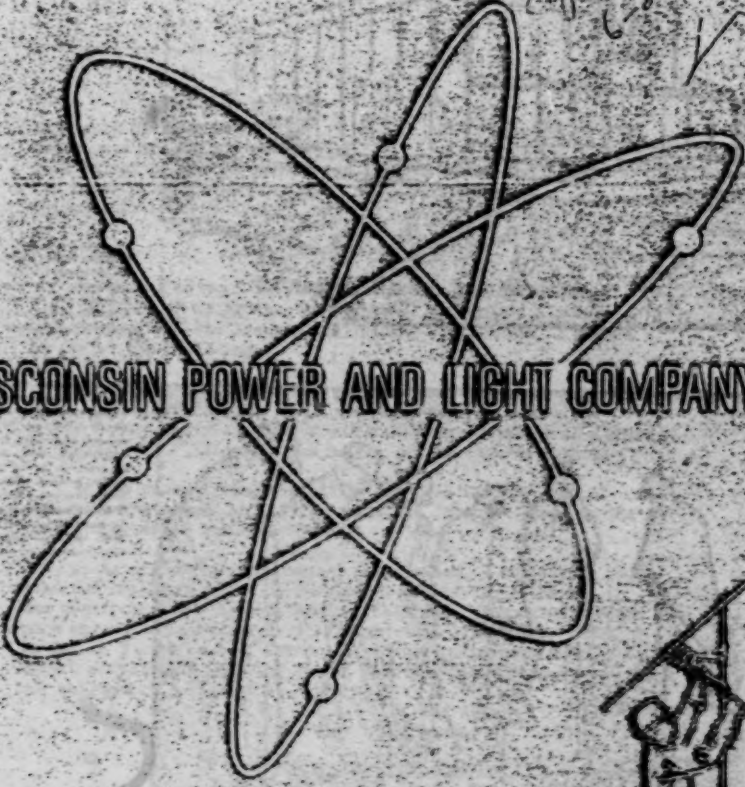


**NOTE:** Boundaries indicate general areas and do not necessarily include all systems within an area.

Figure 3

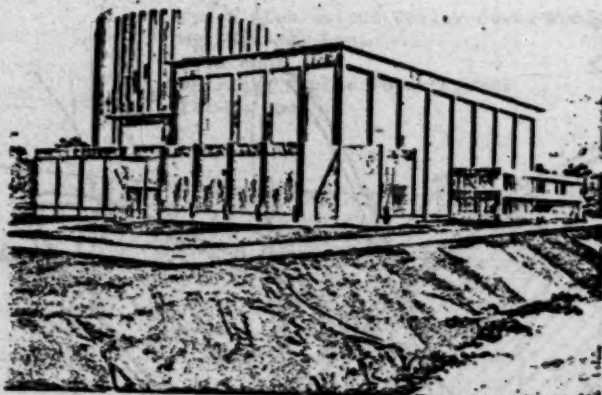


*Abrahamson  
8/2/67  
6-20-67  
✓*



WISCONSIN POWER AND LIGHT COMPANY



**ABERANAMON DEPOSITION  
EXHIBIT 1A**


Swansea Nuclear Electric Generating Station will lead the site when completed in 1973. The plant, jointly owned with two other utilities, is expected to generate power more economically than present plants.



Official ceremonies marking the beginning of construction of the Swansea nuclear plant were held at the site on November 22. Principals included, left to right, Carl J. Parsons, Chairman, WPA; Arthur Hughes, Chairman, Town of Swansea; Ian Brown, President, Swansea Public Service Corporation; Edward Fisher, Chairman, Swansea Gas and Electric Company; J. Ben Howard, President, WPA; and B. L. Giddens, Chairman, Swansea County Board.

*Abrahamson*  
8/4/74  
6-26-79  
J

1411

CLARENCE V. BECK & CO., INC.  
SHALESPIC COAL MINING CO.  
LITTLE DOG COAL CO.

1724 RAILWAY EXCHANGE BLDG.

811 OLIVE STREET  
ST. LOUIS, MO. 63101  
CHRYSLER 1-6710

BECK DEPOSITION  
EXHIBIT 1

LITTLE DOG MINE  
GILLESPIE, ILL.  
ON ILLINOIS TERMINAL RAILROAD  
DAILY CAPACITY - 5000 TONS

November 11, 1968

Antitrust Division,  
Department of Justice,  
2634 United States Courthouse and Federal Office Building,  
219 South Dearborn Street,  
Chicago, Illinois 60604

Gentlemen:

Referring to your inquiry addressed to the Little Dog Coal Company, in regard to the merger of the United Electric Coal Company and the Freeman Coal Mining Corporation, I desire to advise the following.

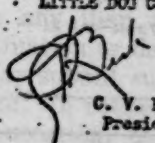
The Little Dog Coal Company ceased business on November 30, 1967. An application for an 11b Receivership is before the United States District Court for the Southern District of Illinois at Springfield, Illinois. The number of the case is S-88-68-975.

At the present time the Little Dog Coal Company has no employees whatsoever and it is impossible for us to look up the detailed evidence that you request.

As an officer of the defunct corporation, I can advise you that the Little Dog Mine is located at Gillespie, Illinois, in the center of the Illinois Terminal Railroad. The output of the mine was marketed mainly locally along that line and by truck. As far as I know none of the coal from this mine came into direct competition with the United Electric Coal Company at any point during its entire history.

Very truly yours,

LITTLE DOG COAL COMPANY

  
C. V. Beck,  
President

Original  
retained by  
Mr. C. Beck

60-0-37950
DEPARTMENT OF JUSTICE
NOV 15 1968
RECEIVED AT CHICAGO

1412

BRAZZALE DEPOSITION  
EXHIBIT 1TJ  
4/14/69 B

GENERAL SERVICES ADMINISTRATION PUBLIC BUILDINGS SERVICE HEATING FUEL ECONOMIC ANALYSIS		1. BLDG 5	2. BUILDING NAME OR NO. F.O.P. 3 U.S. COURTHOUSE	
		3. LOCATION (City and state) CHICAGO, ILLINOIS		
4. BOILER VOLUME (Cu. Ft.)	5. CAPACITY (Sq. Ft.)	6. NO. OF BOILERS 3	7. RATING OF EACH BOILER ONE 25,000 P/HK TWO 50,000 P/HK	8. BOILER PRESSURE (Lbs.) 150 PSI
ITEM		FUEL (For conversions, check (✓) present fuel)		
		1. GAS 2. HEAVY OIL 3. COAL 4. INTERMITTENT 5. ALL YEARS 6. INVESTMENT		
9. PERSONNEL (Number)		A. ENGINEERS 1 B. FLOORMEN 3 C. COAL PASSERS OR HELPERS 3 D. OTHER (Specify)		
10. ANNUAL FUEL CONSUMPTION (Number)		A. COAL (Tons) FIFTH-CITE 7% S <sub>2</sub> 4200 B. GAS (Wobbe-hour) THERM'S 911,900 C. OIL (Gallons) 592,420 D. OTHER (Specify)		
11. PRICES		A. COAL (Per ton delivered to site) 24.50 B. GAS (Per thousand-cu-ft) THERM .03459 C. OIL (Per gallon delivered to site) 21.4 D. OTHER (Specify)		
12. FUEL AS FIRED		A. EFFICIENCY B. EFFICIENCY		
13. INITIAL COST		A. NEW CONSTRUCTION (FUEL OIL STAG 1-3) 25,000 B. CONVERSION 70,000 C. TOTAL 95,000		
14. ANNUAL COST		A. MAINTENANCE 33,000 B. LABOR 3 FIFTH-CITE C. FUEL 124,000 D. GAS 104,700 E. OIL 12,400 F. OTHER (Specify)		
		J. TOTAL (Sum of lines 14a-14f) 161,300 156,200 110,250 112,450		
15. FUEL SELECTED <input type="checkbox"/> A. COAL (Underground) <input type="checkbox"/> B. OIL <input type="checkbox"/> C. GAS <input type="checkbox"/> D. OTHER (Specify)				
16. COMMENTS 1. CONVERT TWO 50,000 P/HK BOILERS WHICH ARE STOKER FIRED AT PRESENT TO BURN EITHER GAS OR OIL. 2. 1ST 240,000 THERM'S @ 6.22¢/THERM, BALANCE @ 5.2¢. ADD 0.5¢/THERM PURCHASE GAS ADJUSTMENT AND .564% CITY UTILITY TAX. 3. M.G. OIL IS 0.1% SULPHUR MAX.				
17. SIGNATURE McBain				18. DATE 2-1-69 4

\*Computed on basis of actual monthly rates applicable.

GSA GEN. REG. 1289

## BURTON DEPOSITION EXHIBIT 1

CH-B-12777-A

Page 6

**SPECIAL AND SUPPLEMENTAL PROVISIONS****SPECIAL REQUIREMENTS**

Where an agency required, under Scope of Contract Provision, to use the Contracts listed herein finds that the specific articles or services contracted for will not meet a special requirement, articles or services having the same general characteristics needed to meet the special requirement may be procured: Provided, that a prior written waiver of the requirement for using this schedule is obtained from the General Services Administration. Request for such waivers shall be submitted to the Commissioner, Federal Supply Service, General Services Administration, Washington D. C. 20405, in accordance with Section 101-26.401-3 of the Federal Property Management Regulation and any implementing regulations of the requesting agency.

**QUOTATIONS:** (a) As used in this schedule the term "F. O. B. Mine (cars)" means free on board cars at the mine or at a water front dock. When the price quoted is F. O. B. Mine (cars) at dock, the bidder shall so indicate by inserting a small (d) in parenthesis after the unit price. A price quoted F. O. B. Mine (cars) without explanation or qualification shall mean free on board cars at the mine. (b) Whether or not this schedule shows that bids on any item are invited on the basis of F. O. B. cars destination or delivered-into-bins at destination the bidder may submit such bids, indicating in the item the basis thereof. In connection with a delivered-into-bin destination quotation, the bidder shall state the truck loading point.

Awards will be made on either an F. O. B. mine bid price (shipment to be made on Government Bills of Lading, or on commercial documents to be converted to Govern-



ment Bills of Lading at the destination) or delivered and stored bid price, except as otherwise indicated in the Schedule, unless the bidder indicates in the bid that delivery at the mine will be unacceptable. *F. O. B. mine price must be stated on all bids even though a bid is submitted on a delivered and stored basis.* If an award F. O. B. mine is not acceptable, a separate notation to this effect should be made on the bidding form, and the F. O. B. mine price inserted in proper space. The truck loading point must be specified in the bids based upon truck delivery. Only one price for entire tentative shipping schedule on each item will be considered. Bids offering separate prices for individual shipping periods under an item will not be considered for award.

The Government reserves the right to reject the bid of a bidder who has previously failed to perform properly or complete on time contracts of a similar nature, or a bid of a bidder who is not in a position to perform the contract.

#### **BUREAU OF MINES ANALYTICAL RECORDS: (a)**

No bid will be considered on coal offered from mines on which the Bureau of Mines does not have analytical records, (b) Whenever the bidder's guaranteed analysis of coal offered or the latest Bureau of Mines analysis of the coal offered shows the offered coal not to be in conformance with the specifications set forth in this Invitation, the bidders offer shall be rejected as being non-responsive.

## KEYSTONE'S MAP OF THE CO

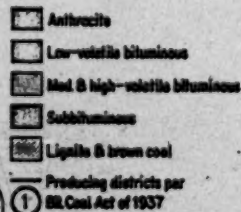


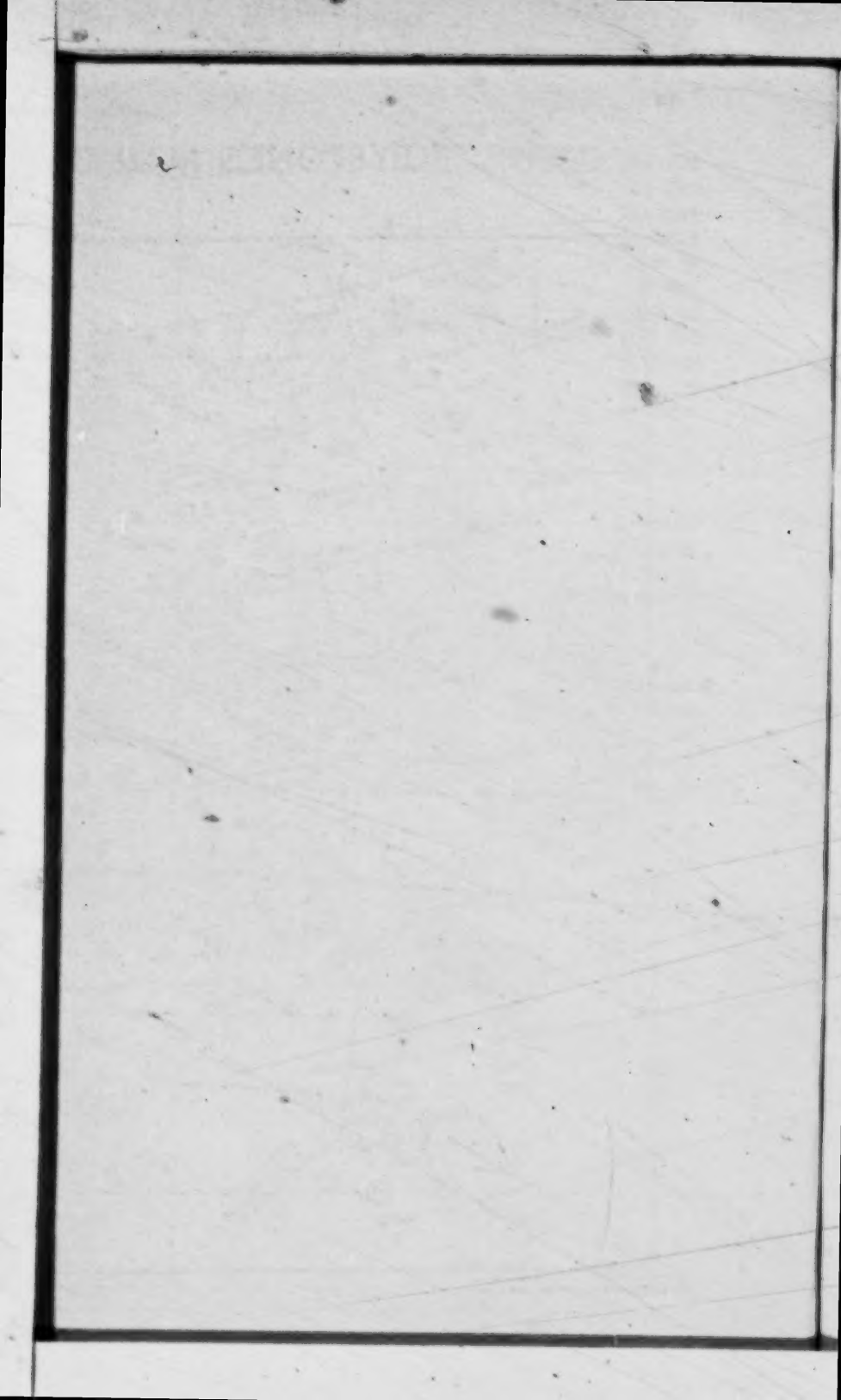
**GOVERNMENT  
EXHIBIT  
Cam. Dep.**

Cam. Dep.

1

Comicia Dep exhibit #1

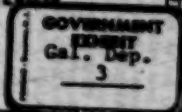






# MINERAL INDUSTRY SURVEYS

U. S. DEPARTMENT OF THE INTERIOR  
BUREAU OF MINES  
WASHINGTON, D. C. 20240



BITUMINOUS COAL AND LIGNITE  
DISTRIBUTION, QUANTITIES

BITUMINOUS COAL AND LIGNITE DISTRIBUTION

CALENDAR YEAR 1967

Prepared March 27, 1968, by Joseph J. Gallagher, Division of Mineral Studies -  
Mineral Resource Evaluation, 202-253,4864.

*Gallagher Dept G #3*  
*12-12-18*  
*AS*



This report shows the distribution of bituminous coal and lignite in the United States during the calendar year of 1967 from coal producing districts of origin to geographic divisions and States of destination, broken down by methods of transportation and types of consumer use, and for 1967 and 1966 by geographic divisions and States of destination, methods of transportation, and types of consumer use. This information provides individuals in the industry, the coal industry as a whole, the Government, and others with a better understanding of the participation of bituminous coal and lignite in the various energy markets of the Nation, both locally and nationally. The detailed data provide a benchmark for special studies and analyses of many of the factors that influence coal production and its utilization in the highly competitive energy market.

The data shown herein are based on reports submitted to the Bureau of Mines voluntarily by producers, sales agents, distributors, wholesalers and Great Lakes and tidewater commercial dock operators who normally produce or sell 100,000 tons or more annually. The Bureau sincerely appreciates the splendid cooperation of the producers and shippers in filling their individual reports, without which this report would not have been possible.

A separate report was requested for each coal producing district in which a company operates mines or from which it markets coal. The coal producing districts are the districts recognized by the bituminous coal and lignite mining industries and are defined on page 3 of this report.

The producing and selling companies covered in the surveys accounted for about 96 percent of all coal produced during the periods covered. The report includes tonnages of coal which the companies covered in the surveys purchased for resale and marketed for smaller producing companies. All reports were edited carefully and verified against data from all other available sources. In order to account for total industry shipments during the periods, estimates for the remaining 4 percent of total shipments are included, based on data from coal trade and other reliable coal statistical reporting agencies.

Shipments from some of the coal producing districts differ slightly from the estimated net district production tonnages reported elsewhere by the Bureau of Mines for the reason that the coal distribution data, in some cases, include raw coal which is cleaned at the points of consumption whereas "production" reports pertain to estimates of cleaned coal only. Also, the distribution information includes some tonnages from small mines with annual output of less than 1,000 tons, the tonnages of which are marketed by and included as part of the shipments of larger producing and selling companies. The Bureau excludes from its standard production figures mines producing less than 1,000 tons per year.

Because of the detailed breakdown of the distribution statistics, certain figures cannot be shown separately without disclosing some of the data of companies that indicated on their report forms that their data may not be revealed. In most of such cases combinations have been made within each producing district of various "consumer uses," and "methods of movement." These combinations are indicated by brackets or explained in detail in the footnotes. In order to avoid disclosing many tonnage data items that otherwise can be revealed and at the same time to keep the number of data items combined or footnoted to the irreducible minimum, the distribution report contains in the detailed "State of Destination" portion a section devoted to the summary of the smaller tonnage items not revealable, broken down by district of origin, method of movement, and consumer use, under the caption "Destinations not revealable." On the national basis the tonnages contained in "Destinations not revealable" in the calendar year of 1967 amount to 996,000 tons or only 0.8 percent of the grand total shipments during the period. The individual district totals range from no tonnages for some districts to a high of 0.9 percent of the district total in District 11. Also, District 6 (West Virginia-Pennsylvania) has been combined with District 5 (Northern West Virginia) and District 20 (Montana) has been combined with District 25 (Washington) to conceal individual company data.

The data are arranged in Table I to show shipments of bituminous coal and lignite during the calendar year of 1967 from each producing district to each State of destination for each consumer use therein (except railroad fuel) by all methods of movement, and where possible, by (1) all-rails; (2) river and seariver; (3) Great Lakes; (4) tidewater; (5) truck; and (6) treasury, conveyor, and private railroad. Following the data that are available by States of destination, consumer use, and method of movement, tonnages are shown for items for which destination and/or consumer use are not available. These items are: (1) shipments to Canadian Great Lakes commercial docks; (2) vessel fuel; (3) shipments to U.S. Great Lakes dock storage; (4) overseas exports; (5) bunker fuel; (6) shipments to U.S. tidewater dock storage; (7) railroad fuel; (8) coal used at mines and sales to employees; and (9) net change in inventory. Table II is a comparative summary of distribution of bituminous coal and lignite produced in the United States during the calendar years 1967 and 1966 by geographic division and States of destination, methods of movement, and consumer use.

Representative users asked to use railroad weights. If the company's records did not show the exact figures, they were asked to estimate the distribution detail required.

All tonnage figures contained herein are in thousand net tons of 2,000 pounds.

The definitions of consumer uses as used in this report follow:

"Electric utilities". All privately owned electric utility companies and all publicly owned agencies engaged in the production and/or distribution of electric light and power. Publicly owned agencies include the following: Municipal electric utilities; Federal projects; rural electrification cooperatives; power districts; and State power projects; and "non-central stations". Non-central stations are those which operate to supply electric power primarily for such functions as public street lighting, water pumping, and sewage disposal.

"Coke and gas plants". Bituminous coal that is carbonized for the manufacture of coke, coal chemical materials, and gas at coking and heating ovens, low- and medium-temperature carbonization operations, and in water gas and other coal gasification processes. This category includes coal used for non-carbonizing purposes such as space heating, foundry use, etc.

"Retail dealers". Any person (including the retail outlet, branch, or department of one who is also a producer, wholesaler, or stock operator), to the extent that he acts in the capacity of a supplier, shipper, or seller of bituminous coal and lignite in any transaction involving shipment, sale, or sale and delivery to a consumer of bituminous coal and lignite physically handled in a truck, wagon, or other less-than-carload facility, without regard to type of transportation or to the quantity or frequency of delivery. Also, all railroad carload shipments that are delivered to a retail dealer's facilities are to be reported in this category (not including, however, carload shipments that are shipped for his account but not to his plant or facilities).

"All others". All consumers of bituminous coal and lignite other than electric utilities, coke and gas plants as defined above, retail dealers, railroads, coal mines, and mine employees.

"Railroad fuel". All coal shipped to railroad companies for engine, powerhouse, station, and all other use. Includes coal furnished to locomotive tenders at the mine tipple.

"Vessel fuel". Coal used by vessel, tug, ferry-boat, or other steam water craft on the Great Lakes.

"Boiler fuel". Coal used by ocean steamers, tugs, ferry-boats, or other steam water craft on the Great Lakes.

"Coal used at mines and sales to employees". Includes coal used at mines for power and heat, coal made into battery coke at mines, and coal used by mine employees.

Instructions to reporting companies on the reporting of "method of movement" included several distinctions that should be borne in mind by the users of this report. Shipments to United States and Canadian railroads for railroad fuel use are excluded from each specific method of movement. Respondents were requested to report total sales to railroads as railroad fuel, reported only as between United States railroad companies and Canadian railroad companies. All-rail shipments include coal loaded into railroad cars at the mines and hauled to ultimate destination via only rail movement, plus coal hauled by truck to a railroad-siding dumping facility and thence shipped to ultimate destination by rail. River shipments include coal loaded directly into river barges at the mines and hauled to river dumping facilities via rail, truck, or other means of transport and thence shipped to ultimate destination via river to companies receiving the coal alongside the river. River movement includes coal loaded directly into river barges at the mines and hauled to river dumping facilities via rail, truck, or other means of transport and thence shipped via river to a river lifting facility from which the coal was transhipped inland to the ultimate consumer or retail dealer located away from the river lifting facility. Great Lakes movement includes coal moving to the dumping piers on Lakes Erie, Ontario, and Michigan for further shipment via the lakes or for use as vessel fuel. Tidewater movement includes coal shipped to tidewater dumping piers for loading into vessels as cargo or ballast and as bunker fuel. Respondents were requested to report as truck movement those shipments destined to the ultimate consumer via truck only.

The reporting companies were asked to report "shipments to distributors and wholesalers" only when the final State of destination and/or consumer use on such shipments were known to the reporting company. Tonnage reported by producers as shipped through these channels were identified by name and address of the distributor or wholesaler, to enable the Bureau to trace the coal to the ultimate State of destination and consumer use.

Users of the distribution data contained herein should bear in mind that these data represent shipments "from" the producing fields and not necessarily consumption or receipts "by" consuming groups or States during the period. "Shipments to" or through certain marketing channels, such as to retail dealers and to storage facilities at Great Lakes and tidewater commercial docks, in some periods may exceed "deliveries from" dealers or facilities to ultimate consumers (primarily because of seasonal factors and coal in transit), while in other periods deliveries from retail dealers and storage facilities may exceed mine shipments to these marketing channels.

Comparable distribution data for the calendar years 1956 through 1966 are available in Bureau of Mines reports, copies of which may be obtained by writing to Chief, Section of Publication Distribution, Bureau of Mines, 4800 Forbes Avenue, Pittsburgh, Pa. 15261.



TABLE 1 - INFORMATION OF BITUMINOUS COAL AND LUMBER PROVIDED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967  
BY DIVISION OF ORIGIN, OCEANOGRAPHIC DIVISION AND STATUS OF DESTINATION, METHOD OF MOVEMENT, AND COMMERCE USE.

(In thousands net tons of 2,000 pounds)

GEOGRAPHIC DIVISION STATUS OF DESTINATION METHOD OF MOVEMENT COMMERCE USE	DIVISION OF ORIGIN										
	1	2	3 and 6	4	7	8	9	10	11		
<b>TOTAL</b>											
Shipments to all destinations in United States, Canada, and Mexico, by all methods of movement and commerce use, and overseas exports, total	552,647	40,490	54,470	45,600	40,973	159,312	47,798	66,083	19,006		
Electric utilities	296,277	29,028	27,768	31,650	2,186	60,729	43,826	49,299	19,479		
Coal and gas plants	79,786	8,445	7,082	-	17,607	28,886	194	8,128	-		
Railroad fuel	29,799	444	348	2,379	1,588	8,074	2,337	2,283	490		
All others	96,785	6,588	8,142	12,168	8,699	30,699	8,670	13,611	6,137		
Canadian Great Lakes commercial docks (commerce use not available)	1,179	151	40	159	151	855	38	17,160	115		
U.S. Great Lakes dock storage (commerce use not available)	368	15	96	99	3	116	-	-	-		
U.S. tidewater dock storage (commerce use not available)	-	-13	98	-147	119	-86	16	-41	-		
Coal used at mines and sales to employees	-	-	5	-	14	-9	-	-	-		
Net change in mine inventory (overseas exports (excludes Canada- commerce use not available))	1,478	45	10	16	688	366	35	19	16		
Overseas exports (excludes Canada- commerce use not available)	665	-41	68	160	441	-49	-	-	-		
	24,174	-	724	-	15,708	16,413	-	-	-		
Shipments to all destinations in United States, Canada, and Mexico, by specific method of movement and commerce use (excludes railroad fuel; Canadian Great Lakes commercial docks; U.S. Great Lakes and tidewater dock storage; coal used at mines and sales to employees; net change in mine inventory and overseas exports)											
All-rail, total	276,800	10,138	27,244	20,169	18,248	67,431	18,273	26,273	10,280		
Electric utilities	155,940	1,209	17,199	14,661	1,854	43,585	34,350	43,441	6,807		
Coal and gas plants	30,251	6,560	5,060	-	7,239	17,580	1,066	8,108	-		
Railroad fuel	10,984	80	883	273	1,808	3,718	1,069	1,108	811		
All others	8,085	8,803	6,803	5,823	8,943	20,676	3,809	9,659	3,939		
River and co-river, total	29,396	22.6	7,794	3,946	5,114	18,715	28,894	19,496	9,403		
Electric utilities	65,096	8,461	6,087	5,568	71	6,814	21,084	17,811	8,405		
Coal and gas plants	47,979	17,008	1,809	-	5,050	3,915	-	-	-		
Railroad fuel	2,852	-	-	6	-	34	941	246	-		
All others	6,096	2,037	609	113	25	8,958	969	1,381	-		

See footnotes at end of table.

TABLE 1 - DISTRIBUTION OF BITUMINOUS COAL AND LUMBER PROVIDED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967  
BY DISTRICT OR COUNTRY, GEOGRAPHIC DIVISION AND STATUS OF MOVEMENT, METHOD OF MOVEMENT, AND CONSUMER USE (cont.)  
(In Thousand Net Tons of 2,000 Pounds)

GEOGRAPHIC DIVISION STATUS OF MOVEMENT METHOD OF MOVEMENT CONSUMER USE	DISTRICT OF ORIGIN									
	12	13	14	15	16	17	18	19	20	21
Shipments to all destinations in United States, Canada, and Mexico, by all methods of movement and consumer use, and overseas exports, total	874	16,091	497	2,125	675	2,346	2,898	2,619	4,060	4,122
Electric utilities	685	9,006	-	1,772	549	2,040	2,865	2,601	3,704	3,119
Gas and gas plants	-	6,139	435	138	-	2,076	-	87	1,690	704
Retail dealers	-	136	-	61	-	294	3	114	777	895
All others	-	615	60	462	77	313	34	694	577	275
Railroad fuel	181	-	-	8	-	-	-	31	5	56
Canadian Great Lakes commercial docks (consumer use not available)	-	-	-	-	-	-	-	-	-	-
U.S. Great Lakes dock storage (consumer use not available)	-	-	-	-	-	-	-	-	-	-
U.S. tidewater dock storage (consumer use not available)	-	-	-	-	-	-	-	-	-	-
Coal used at mines and sales to employees	-	-	-	-	-	-	-	-	-	-
Net change in mine inventory	-	8	-	-45	4	8	-7	8	31	24
Overseas exports (excludes Canada- consumer use not available)	-	-5	-	-	-	-	-	-	26	74
Shipments to all destinations in United States, Canada, and Mexico, by specific method of movement and consumer use (excludes railroad fuel, Canadian Great Lakes commercial docks, U.S. Great Lakes and tidewater dock storage, coal used at mines and sales to employees, net change in mine inventory and overseas exports)	877	9,765	497	2,028	437	4,349	278	1,326	3,774	4,836
All-rail, total	654	5,310	435	2,569	368	1,217	256	766	2,008	2,008
Electric utilities	-	5,006	-	138	-	2,076	-	87	1,690	704
Gas and gas plants	-	61	-	33	-	131	-	114	295	294
Retail dealers	-	395	60	808	39	305	16	609	475	574
All others	-	-	-	-	-	-	-	-	-	-
River and air-river, total	-	4,454	-	-	-	-	-	-	-	-
Electric utilities	-	4,073	-	-	-	-	-	-	-	-
Gas and gas plants	-	47	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-
All others	-	894	-	-	-	-	-	-	-	-

See footnotes at end of table.



TABLE 1 - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)  
(In Thousand Net Tons)

STATE OF ORIGIN METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN <sup>1/</sup>									
		1	2	3 and 6	4	7	8	9	10	11	
United States, Canada, and Mexico (continued)											
Great Lakes, total <sup>2/</sup>	53,070	644	2,006	6,521	7,660	4,445	24,003	1,561	3,302	1,223	
Electric utilities	25,971	242	1,006	3,153	6,350	3,500	9,870	1,174	2,568	739	
Coal and gas plants	13,596	-	283	175	501	228	9,288	-	115	-	
Retail dealers	3,173	18	138	171	201	227	1,872	63	115	7	
All others	18,508	586	636	1,211	899	217	7,053	308	1,497	409	
Piedmont, total <sup>2/</sup>	21,370	3,724	271	8,076	-	1,212	6,077	-	-	-	
Electric utilities	14,587	4,615	37	6,000	-	1,176	5,669	-	-	-	
Coal and gas plants	6,866	700	234	2,048	-	1,033	2,161	-	-	-	
Retail dealers	4	1	-	8	-	1	-	-	-	-	
All others	573	368	-	86	-	217	-	-	-	-	
Trunk, total	47,597 <sup>3/</sup>	9,569	2,007 <sup>4/</sup>	3,733	13,638	166	2,090	2,193	6,430	3,782	
Electric utilities	25,119 <sup>5/</sup>	6,480	2,006 <sup>6/</sup>	3,562	10,971	-	1,635	2,708	5,668	1,694	
Coal and gas plants	1,154	598	840	38	729	-	136	194	-	-	
Retail dealers	3,263	302	338	78	228	27	256	67	737	22	
All others	17,961	2,849	3,030 <sup>7/</sup>	280	5,158	65	501	284	2,981	2,415	
Tramway, conveyor, and private railroad, total	16,408	141	741	141	141	141	-	-	141	141	
Electric utilities	16,408	141	741	141	141	141	-	-	141	141	
Coal and gas plants	16,408	-	-	-	-	-	-	-	-	-	
Retail dealers	-	-	-	-	-	-	-	-	-	-	
All others	-	-	-	-	-	-	-	-	-	-	

Footnotes at end of table.

See footnotes at end of table.

TABLE 1 - DISTRIBUTION OF IMPORTED COAL AND LUMBER PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1907 (cont.)  
(In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF ORIGIN METHOD OF MOVEMENT CONSUMERS USE	MONTH OF ORIGIN									
	18	19	20	21	22	23	24	25	26	27
United States, Canada, and Mexico (continued)										
Great Lakes, total 2										
Electric utilities										
Coal and gas plants										
Retail dealers										
All others										
Wisconsin, total 2										
Electric utilities										
Coal and gas plants										
Retail dealers										
All others										
Texas, total										
Electric utilities										
Coal and gas plants										
Retail dealers										
All others										
Tramway, carrier, and private railroad, total										
Electric utilities										
Coal and gas plants										
Retail dealers										
All others										

See footnotes at end of table.

TABLE 1 - DISTRIBUTION OF EXTENDING COAL AND LUMBER PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.) (In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRIBUTION OF ORIGIN <sup>1/</sup>									
		1	2	3 and 6	4	7	8	9	10	11	12 thru 23
<b>Dist. to</b>											
<b>New England</b>											
Massachusetts, total	4,022	890	18	1,187	-	99	1,808	-	-	-	-
All methods of movement:	3,418	743	2	961	-	64	1,648	-	-	-	-
Electric utilities	110	41	-	81	-	33	15	-	-	-	-
Retail dealers	494	106	16	80	-	8	169	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-	-
All-rail, total	1,466	849	18	530	-	34	78	-	-	-	-
Electric utilities	1,085	704	2	309	-	-	15	-	-	-	-
Retail dealers	109	41	-	80	-	33	15	-	-	-	-
All others	338	104	16	80	-	1	6	-	-	-	-
Tidewater, total	2,856	11	-	67	-	66	1,793	-	-	-	-
Electric utilities	2,393	35	-	66	-	64	1,654	-	-	-	-
Retail dealers	4	-	-	-	-	-	-	-	-	-	-
All others	168	8	-	1	-	1	139	-	-	-	-
Connecticut, total	4,793	8,998	-	1,149	-	898	408	-	-	-	-
All methods of movement:	4,020	2,791	-	1,091	-	118	36	-	-	-	-
Electric utilities	149	-	-	-	-	186	378	-	-	-	-
Coal and gas plants	18	-	-	-	-	-	-	-	-	-	-
Retail dealers	868	807	-	50	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-	-
All-rail, total	1,266	468	-	1,098	-	-	8	-	-	-	-
Electric utilities	1,390	390	-	1,039	-	-	-	-	-	-	-
Coal and gas plants	-	-	-	-	-	-	-	-	-	-	-
Retail dealers	11	-	-	-	-	-	-	-	-	-	-
All others	148	118	-	30	-	-	-	-	-	-	-
Tidewater, total	2,807	2,746	-	33	-	818	400	-	-	-	-
Electric utilities	2,641	2,441	-	38	-	118	38	-	-	-	-
Coal and gas plants	489	-	-	-	-	186	364	-	-	-	-
Retail dealers	1	-	-	-	-	-	-	-	-	-	-
All others	108	98	-	-	-	-	-	-	-	-	-
Maine, New Hampshire, Vermont, and Rhode Island, total	986	49	33	647	-	10	197	-	-	-	-
All methods of movement:	719	-	3	528	-	-	187	-	-	-	-
Electric utilities	148	35	-	17	-	1	3	-	-	-	-
Retail dealers	145	-	-	38	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-	-

See footnotes at end of table.

TABLE 1 - DISTRIBUTION OF BITUMINOUS COAL AND LUMBER PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1947 (cont.) (In thousands net tons)

GEOGRAPHIC DIVISION SOURCE OF DISTRIBUTION METHOD OF MOVEMENT CONSUMER USE	TOTAL	MONTHS OF ORIGIN									
		1	2	3 and 6	4	7	8	9	10	11	12 thru 43
<b>Maine, New Hampshire, Vermont, and Rhode Island (continued)</b>											
All-rail, total	734	49	83	607	-	-	7	-	-	-	-
Electric utilities	538	-	-	538	-	-	-	-	-	-	-
Retail dealers	141	10	3	57	-	-	-	-	-	-	-
All others	161	39	80	50	-	-	2	-	-	-	-
Tidewater, total	188	-	-	-	-	-	180	-	-	-	-
Electric utilities	187	-	-	-	-	-	187	-	-	-	-
Retail dealers	1	-	-	-	-	-	-	-	-	-	-
All others	4	-	-	-	-	-	3	-	-	-	-
<b>Mid-Atlantic</b>											
New York, total	87,500	9,187	5,028	10,413	476	818	5,969	-	-	-	-
All methods of movement:											
Electric utilities	14,330	4,871	165	7,879	839	-	1,718	-	-	-	-
Coal and gas plants	5,980	1,550	8,328	-	-	186	1,508	-	-	-	-
Retail dealers	168	15	65	74	80	13	945	-	-	-	-
All others	6,885	5,351	497	8,360	817	19	-	-	-	-	-
All-rail, total	81,861	7,376	5,038	8,909	475	38	8,054	-	-	-	-
Electric utilities	9,889	8,859	165	6,584	839	-	1,765	-	-	-	-
Coal and gas plants	5,609	1,550	8,328	-	-	13	1,508	-	-	-	-
Retail dealers	164	14	65	74	80	19	891	-	-	-	-
All others	6,865	8,893	497	8,367	816	19	-	-	-	-	-
Great Lakes, total	510	-	-	140	1	186	185	-	-	-	-
Electric utilities	189	-	-	189	-	-	-	-	-	-	-
Coal and gas plants	331	-	-	-	-	186	145	-	-	-	-
All others	90	-	-	11	1	-	38	-	-	-	-
Tidewater, total	3,900	889	-	1,884	-	-	1,728	-	-	-	-
Electric utilities	3,779	729	-	1,856	-	-	1,718	-	-	-	-
All others	121	167	-	-	-	-	10	-	-	-	-
Trunk, total	909	909	-	-	-	-	-	-	-	-	-
Electric utilities	577	577	-	-	-	-	-	-	-	-	-
Retail dealers	1	1	-	-	-	-	-	-	-	-	-
All others	331	331	-	-	-	-	-	-	-	-	-

See footnotes at end of table.

TABLE 1 - DISTRIBUTION OF BITUMINOUS COAL AND LUMBER PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.) (In Thousand Net Tons)

ECONOMIC DIVISION STATE OF ORIGIN METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN										
		1	2	3 and 6	4	7	8	9	10	11	12 thru	
New Jersey, total	7,665	8,126	34	5,087	-	133	438	-	-	-	83	
All methods of movement:												
Electric utilities	6,403	1,672	-	4,647	-	127	131	-	-	-	-	
Coal and gas plants	15	7	-	8	-	-	137	-	-	-	-	
Retail dealers	597	507	34	378	-	-	40	-	-	-	-	
All others												
All-rail, total	5,218	8,078	34	5,117	-	19	64	-	-	-	-	
Electric utilities	4,324	1,569	-	8,758	-	13	64	-	-	-	-	
Coal and gas plants	38	-	-	-	-	-	-	-	-	-	-	
Retail dealers	15	7	34	8	-	-	40	-	-	-	-	
All others	911	482	-	351	-	-	-	-	-	-	-	
Tidewater, total	8,573	1,077	-	1,910	-	118	404	-	-	-	-	
Electric utilities	8,049	86	-	1,889	-	118	107	-	-	-	-	
Coal and gas plants	493	-	-	-	-	-	317	-	-	-	-	
All others	46	25	-	21	-	-	-	-	-	-	-	
Pennsylvania, total	61,197	15,800	25,822	18,846	284	4,570	4,873	-	-	-	-	
All methods of movement:												
Electric utilities	25,595	11,356	5,822	6,260	-	4,330	47	-	-	-	-	
Coal and gas plants	27,369	1,580	15,180	4,180	-	-	3,679	-	-	-	-	
Retail dealers	761	335	44	81	80	21	10	-	-	-	-	
All others	9,458	8,769	4,856	1,687	204	219	537	-	-	-	-	
All-rail, total	21,668	8,045	28,051	11,164	195	5	8,013	-	-	-	-	
Electric utilities	10,468	6,115	3,166	7,884	-	5	5	-	-	-	-	
Coal and gas plants	7,448	982	15,889	4,180	-	5	1,693	-	-	-	-	
Retail dealers	183	36	19	77	175	21	10	-	-	-	-	
All others	5,565	948	1,981	1,689	175	5	305	-	-	-	-	
River and seariver, total	28,191	3	3	3	3	3,506	8,860	-	-	-	-	
Electric utilities	2,148	-	-	-	-	3,506	48	-	-	-	-	
Coal and gas plants	18,099	3	-	-	-	-	8,186	-	-	-	-	
All others	1,353	-	-	-	-	-	38	-	-	-	-	
Tidewater, total	8,805	684	9	1,076	-	5	5	-	-	-	-	
Electric utilities	1,789	687	9	1,076	-	5	5	-	-	-	-	
Coal and gas plants	384	57	-	-	-	5	5	-	-	-	-	
All others	642	-	-	-	-	-	-	-	-	-	-	
Trunk, total	13,139	7,171	5,931	8	29	-	-	-	-	-	-	
Electric utilities	7,850	7,154	7,715	-	-	-	-	-	-	-	-	
Coal and gas plants	832	589	829	-	-	-	-	-	-	-	-	
Retail dealers	269	269	389	-	-	-	-	-	-	-	-	
All others	1,170	2,603	-	-	89	-	-	-	-	-	-	

See footnotes at end of table.



TABLE 1. - IMPORTATION OF BITUMINOUS COAL AND LIGNITE PROVIDED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.) (In thousands net tons)

COMMODITY DIVISION SPECIES OF DESTINATION METHOD OF MOVEMENT CONTAINER USE	TOTAL	MONTHS OF ORIGIN										12 thru 63
		1	2	3 and 6	4	5	6	7	8	9	10	
Pennsylvania (continued)												
Tramway, conveyor, and private railroad, total	3,333	334	6,464	3,615	31,351	2,342	12,409	2,011				
Electric utilities												
Coal and gas plants												
West North Central												
Ohio, total	59,785	334	6,464	3,615	31,351	2,342	12,409	2,011				
All methods of movement:												
Electric utilities	30,056	334	6,464	3,615	31,351	2,342	12,409	2,011				
Coal and gas plants	11,620											
Retail dealers	8,131	77	1,008	669	6,678	431	5,068					
All others	10,039											
All-rail, total	28,536	334	6,464	3,615	31,351	2,342	12,409	2,011				
Electric utilities	11,620											
Coal and gas plants	1,671											
Retail dealers	1,515	77	1,008	669	6,678	431	5,068					
All others	8,421											
Motor and air-river, total	23,419		8,423	2,768	2,897			2,011				
Electric utilities	9,459		8,390	2,768	2,897			2,011				
Coal and gas plants	5,184											
Retail dealers	128											
All others	918											
Great Lakes, total	3,176	77										
Electric utilities	2,668											
Coal and gas plants	467											
Retail dealers	4											
All others	67	77										
Trunk, total	13,993		427	108	13,095							
Electric utilities	7,032		310	91	6,631							
Retail dealers	808		6	37	756							
All others	5,179		111	17	5,056							
Tramway, conveyor, and private railroad, total	3,333											
Electric utilities												

See footnotes at end of table.

TABLE 1. DISTRIBUTION OF BITUMINOUS COAL AND LUMBER PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.) (In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF ORIGIN METHOD OF MOVEMENT CONSUMER USE	DISTRICT OF ORIGIN									
	1	2	3 and 6	4	7	8	9	10	11	12 thru 83
<b>TOTAL</b>										
<b>Indiana, total</b>	40,441		402		4,904	8,090	5,679	5,316	15,642	-
All methods of movement:										
Electric utilities	20,024					690	5,408	3,767	10,799	-
Coke and gas plants	12,351		393		4,893	6,465	8	640	406	-
Retail dealers	1,070		2		22	495	6	19	106	-
All others	6,456		2		27	405	965	1,090	4,657	-
<b>All-rail, total</b>	25,790		402		4,904	7,411	5,679	5,473	8,955	-
Electric utilities	16,394					43	5,408	3,767	6,552	-
Coke and gas plants	10,799		393		4,893	6,465	8	640	406	-
Retail dealers	2,000		2		27	405	965	1,090	2,849	-
All others	3,880		2			577	2	1,059	2,849	-
<b>River and waterway, total</b>	8,651								2,472	-
Electric utilities	6,654								2,472	-
Retail dealers	50									-
All others	177									-
<b>Great Lakes, total</b>	1,351									-
Coke and gas plants	1,351									-
<b>Truck, total</b>	3,471									-
Electric utilities	810								41	-
Retail dealers	438								41	-
All others	2,459								2,368	-
<b>Tramway, conveyor, and private railroad, total</b>	946								946	-
Electric utilities	946								946	-
<b>Illinois, total</b>	46,710		167	12	842	2,961	3,150	38,510	1,008	-
All methods of movement:										
Electric utilities	29,497					17	2,121	26,485	54	-
Coke and gas plants	5,449		110		597	1,240	647	1,461	37	-
Retail dealers	2,074		5	12	4	1,268	128	1,051	317	-
All others	9,690		34		251	382	128	2,364	317	-
<b>All-rail, total</b>	25,475		157		669	2,812	3,150	20,369	776	-
Electric utilities	15,695					17	2,121	15,456	2	-
Coke and gas plants	5,449		110		597	1,240	647	1,461	250	-
Retail dealers	2,074		5		4	1,268	128	1,051	317	-
All others	6,157		42		251	382	128	2,364	317	-

See footnotes at end of table.

TABLE 1 - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.) (In Thousand Wet Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN 1/										
		1	2	3 and 6	4	7	8	9	10	11	12 thru 25	
		Illinois (continued)										
River and ex-river, total	15,395	-	-	10	-	70	128	2	12,733	2	-	
Electric utilities	13,090	-	-	-	-	-	-	-	10,591	2	-	
Coal and gas plants	70	-	-	-	-	70	-	-	-	-	-	
Retail dealers	689	-	-	-	-	-	128	2	556	2	-	
All others	1,346	-	-	10	-	-	-	-	1,506	2	-	
Great Lakes, total	130	-	-	-	12	87	21	-	-	-	-	
Electric utilities	-	-	-	-	-	-	-	-	-	-	-	
Coal and gas plants	106	-	-	-	-	87	19	-	-	-	-	
Retail dealers	34	-	-	-	12	-	2	-	-	-	-	
All others	-	-	-	-	-	-	-	-	-	-	-	
Truck, total	4,551	-	-	-	-	-	-	-	4,259	312	-	
Electric utilities	2,613	-	-	-	-	-	-	-	1,559	284	-	
Coal and gas plants	1,699	-	-	-	-	-	-	-	699	-	-	
Retail dealers	2,259	-	-	-	-	-	-	-	2,211	28	-	
All others	-	-	-	-	-	-	-	-	-	-	-	
Tramway, conveyor, and private railroad, total	1,169	-	-	-	-	-	-	-	1,169	-	-	
Electric utilities	1,169	-	-	-	-	-	-	-	-	-	-	
Michigan, total	34,959	240	282	1,404	10,581	1,746	18,221	965	1,149	571	-	
All methods of movement:												
Electric utilities	19,605	192	282	1,107	10,581	19	8,268	898	249	519	-	
Coal and gas plants	1,751	-	-	-	-	1,582	3,299	-	-	-	-	
Retail dealers	2,169	44	282	28	269	230	1,127	10	28	-	-	
All others	9,476	44	-	269	-	115	5,617	117	872	52	-	
All-rail, total	14,834	-	-	104	6,819	229	6,929	597	159	17	-	
Electric utilities	8,461	-	-	77	4,896	-	2,932	566	-	-	-	
Coal and gas plants	31	-	-	-	-	1	30	-	-	-	-	
Retail dealers	2,053	-	-	-	-	125	835	-	-	-	-	
All others	5,511	-	-	25	1,923	45	3,132	35	159	17	-	
Great Lakes, total	80,135	240	282	1,500	3,562	1,517	11,292	368	1,010	554	-	
Electric utilities	17,158	192	282	1,090	3,562	19	5,156	276	249	519	-	
Coal and gas plants	4,560	-	-	-	-	1,581	3,179	-	-	-	-	
Retail dealers	4,560	44	282	-	3,562	1,581	3,179	10	28	-	-	
All others	5,967	44	-	246	-	72	2,485	82	733	55	-	

See footnotes at end of table.

TABLE 1 - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)

(In Thousand Net Tons)											
GEOGRAPHIC DIVISION STATE OF ORIGIN METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN									
		1	2	3 and 6	4	7	8	9	10	11	
Wisconsin, total	15,581	25	458	428	897	456	5,565	5,112	6,108	680	
All methods of movement:											
Electric utilities	8,358	-		48			490	2,587	4,562	280	
Coke and gas plants	1,971	-	458		897	191	506				
Retail dealers	1,031	14		101		89	1,040	105	131	400	
All others	4,812	9		275			1,727	422	1,615		
All-rail, total	4,715			4	3	67	565	2,106	2,597	400	
Electric utilities	2,528						64	1,689	2,049		
Coke and gas plants	47						47				
Retail dealers	169					58	58	65	42		
All others	2,109				3	9	194	354	1,206	400	
River and ex-river, total	1,285										
Electric utilities	1,205										
Retail dealers	1,404										
All others	61										
Great Lakes, total	2,941	25	458	420	894	589	5,200	1,006	2,813	280	
Electric utilities	4,556	-		48			426	868	2,515		
Coke and gas plants	1,550	-			894	191	259				
Retail dealers	1,689	14				118	982		89		
All others	2,046	9		275		80	1,555	68	409		
West North Central											
Minnesota, total	7,142	12	45	570	211	468	1,311	407	2,695	491	
All methods of movement:											
Electric utilities	4,157	-		458	49		64	196	2,551	55	
Coke and gas plants	289	-	15		100	597	532				
Retail dealers	655	-	28	69	62	45	559	86	39		
All others	1,591	12				28	556	125	105	458	
All-rail, total	1,445			20			91	295	2,619	55	
Electric utilities	1,186	-		20			47	196	2,551	55	
Retail dealers	28	-					47	70	13		
All others	215	-					44	29	55		
River and ex-river, total	2,509										
Electric utilities	2,509										
Retail dealers	2,508										
All others	85										
Great Lakes, total	5,130	12	45	550	211	468	1,220	112	76	458	
Electric utilities	3,521	-		458	49		64				
Coke and gas plants	1,550	-			100	597	532				
Retail dealers	1,689	12		15		45	559		16		
All others	1,095	-		69	62	28	512	96	50	458	

See footnotes at end of table.

TABLE 1 - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)

(In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	DISTRICT OF ORIGIN 1/							
	12	13	14	15 Rec. Yr.	16	17	18	19
Wisconsin, total (continued)								
All methods of movement:								
Electric utilities								
Coke and gas plants								
Retail dealers								
All others								
All-rail, total								
Electric utilities								
Coke and gas plants								
Retail dealers								
All others								
River and ex-river, total								
Electric utilities								
Retail dealers								
All others								
Great Lakes, total								
Electric utilities								
Coke and gas plants								
Retail dealers								
All others								
West North Central								
Minnesota, total				65				
All methods of movement:				65				
Electric utilities								
Coke and gas plants								
Retail dealers								
All others								
All-rail, total				65				
Electric utilities								
Retail dealers								
All others								
River and ex-river, total				65				
Electric utilities								
Retail dealers								
All others								
Great Lakes, total				65				
Electric utilities								
Coke and gas plants								
Retail dealers								
All others								

See footnotes at end of table.



TABLE 1 - DISTRIBUTION OF EXTENSIBLE COAL AND LIGHTWE PRODUCTION IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)

(In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN									
		1	2	3 and 6	4	7	8	9	10	11	
Iowa, total	5,549	-	-	-	-	65	157	419	3,569	77	
All methods of movement:											
Electric utilities	3,287	-	-	-	-	-	155	225	1,950	-	
Retail dealers	355	-	-	-	-	-	4	156	75	77	
All others	1,907	-	-	-	-	65	-	58	1,544	-	
All-rail, total	4,360	-	-	-	-	65	124	144	2,745	77	
Electric utilities	2,250	-	-	-	-	-	-	-	-	-	
Retail dealers	350	-	-	-	-	-	-	-	-	-	
All others	1,760	-	-	-	-	65	120	144	2,745	-	
River and ex-river, total	1,095	-	-	-	-	-	-	269	826	77	
Electric utilities	952	-	-	-	-	-	-	269	826	-	
Retail dealers	6	-	-	-	-	-	-	-	-	-	
All others	137	-	-	-	-	-	-	-	-	-	
Great Lakes, total	10	-	-	-	-	-	15	6	-	-	
Retail dealers	19	-	-	-	-	-	-	-	-	-	
Truck, total	67	-	-	-	-	-	-	-	-	-	
Electric utilities	45	-	-	-	-	-	-	-	-	-	
Retail dealers	-	-	-	-	-	-	-	-	-	-	
All others	22	-	-	-	-	-	-	-	-	-	
Missouri, total	9,389	-	16	-	-	150	122	28	5,651	-	
All methods of movement:											
Electric utilities	6,944	-	-	-	-	-	-	9	3,758	-	
Coal and gas plants	219	-	16	-	-	150	75	11	119	-	
Retail dealers	189	-	-	-	-	-	45	8	1,774	-	
All others	2,037	-	2	-	-	-	-	28	3,085	-	
All-rail, total	4,947	-	-	-	-	85	5	9	2,004	-	
Electric utilities	3,246	-	-	-	-	85	-	11	1,061	-	
Coal and gas plants	65	-	-	-	-	-	-	8	1,604	-	
Retail dealers	99	-	-	-	-	-	-	-	1,601	-	
All others	1,121	-	2	-	-	-	-	-	5	-	
River and ex-river, total	1,782	-	16	-	-	45	117	-	966	-	
Electric utilities	1,601	-	-	-	-	45	73	-	252	-	
Coal and gas plants	14	-	-	-	-	-	-	-	-	-	
All others	17	-	-	-	-	-	-	-	-	-	
Truck, total	3,060	-	-	-	-	-	-	-	-	-	
Electric utilities	2,097	-	-	-	-	-	-	-	-	-	
Retail dealers	94	-	-	-	-	-	-	-	-	-	
All others	869	-	-	-	-	-	-	-	-	-	

See footnotes at end of table.

See footnotes at end of table.

TABLE 1 - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	DISTRICT OF ORIGIN 1/									
	12	13	14	15 Bal. Ter.	16	17	18	19	20	21
Iowa, total (continued)	874	-	-	404	-	6	-	-	-	24,235
All methods of movement:	685	-	-	369	-	-	-	-	-	-
Electric utilities	-	-	-	5	-	6	-	-	-	-
Retail dealers	191	-	-	30	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-
All-rail, total	807	-	-	404	-	6	-	-	-	-
Electric utilities	636	-	-	369	-	-	-	-	-	-
Retail dealers	5	-	-	5	-	6	-	-	-	-
All others	169	-	-	30	-	-	-	-	-	-
River and ex-river, total	-	-	-	-	-	-	-	-	-	-
Electric utilities	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-
Great Lakes, total	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-
Truck, total	61	-	-	-	-	-	-	-	-	-
Electric utilities	45	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-
All others	22	-	-	-	-	-	-	-	-	-
Missouri, total	-	-	-	3,440	-	-	-	-	-	-
All methods of movement:	-	-	-	3,177	-	-	-	-	-	-
Electric utilities	-	-	-	-	-	-	-	-	-	-
Coke and gas plants	-	-	-	55	-	-	-	-	-	-
Retail dealers	-	-	-	208	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-
All-rail, total	-	-	-	1,342	-	-	-	-	-	-
Electric utilities	-	-	-	-	-	-	-	-	-	-
Coke and gas plants	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	1,395	-	-	-	-	-	-
All others	-	-	-	49	-	-	-	-	-	-
River and ex-river, total	-	-	-	-	-	-	-	-	-	-
Electric utilities	-	-	-	-	-	-	-	-	-	-
Coke and gas plants	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-
Truck, total	-	-	-	-	-	-	-	-	-	-
Electric utilities	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-
Truck, total	-	-	-	2,098	-	-	-	-	-	-
Electric utilities	-	-	-	1,939	-	-	-	-	-	-
Retail dealers	-	-	-	159	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-

See footnotes at end of table.

TABLE 1 - DISTRIBUTION OF BITUMINOUS COAL AND LUMBER PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1961 (cont.)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	(In thousands net tons)									
	TOTAL	1	2	3 and 6	4	7	8	9	10	11
Missouri, (continued)										
Tramway, conveyor, and private railroad, total	5,427	-	-	-	-	-	-	-	-	-
Electric utilities	2,622	-	-	6	-	4	35	-	10	-
North and South Dakota, total	2,622	-	-	-	-	-	-	-	4	-
All methods of movement:	2,622	-	-	-	-	-	-	-	-	-
Electric utilities	2,622	-	-	-	-	-	-	-	-	-
Retail dealers	437	-	-	-	-	-	-	-	-	-
All others	437	-	-	-	-	-	-	-	-	-
All-rail, total	2,622	-	-	-	-	-	-	-	-	-
Electric utilities	2,622	-	-	-	-	-	-	-	-	-
Retail dealers	437	-	-	-	-	-	-	-	-	-
All others	437	-	-	-	-	-	-	-	-	-
Great Lakes, total	437	-	-	-	-	-	-	-	-	-
Retail dealers	437	-	-	-	-	-	-	-	-	-
Trunk, total	1,351	-	-	-	-	-	-	-	-	-
Electric utilities	1,091	-	-	-	-	-	-	-	-	-
Retail dealers	59	-	-	-	-	-	-	-	-	-
All others	1	-	-	-	-	-	-	-	-	-
Tramway, conveyor, and private railroad, total	1,354	-	-	-	-	-	-	-	-	-
Electric utilities	1,354	-	-	-	-	-	-	-	-	-
Nebraska and Kansas, total	861	-	-	-	-	-	-	-	-	-
All methods of movement:	861	-	-	-	-	-	-	-	-	-
Electric utilities	861	-	-	-	-	-	-	-	-	-
Retail dealers	347	-	-	-	-	-	-	-	-	-
All others	347	-	-	-	-	-	-	-	-	-
All-rail, total	1,354	-	-	-	-	-	-	-	-	-
Electric utilities	1,354	-	-	-	-	-	-	-	-	-
Retail dealers	347	-	-	-	-	-	-	-	-	-
All others	347	-	-	-	-	-	-	-	-	-
Trunk, total	128	-	-	-	-	-	-	-	-	-
Electric utilities	128	-	-	-	-	-	-	-	-	-
Retail dealers	128	-	-	-	-	-	-	-	-	-
All others	128	-	-	-	-	-	-	-	-	-

See footnotes at end of table.

TABLE 1 - DISTRIBUTION OF BITUMINOUS COAL AND LUMITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)

(In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT COMBINED USE	DISTRICT OF ORIGIN 1/2										
	12	13	14	15 Bel.Tex.	16	17	18	19	20	21	22a23
Missouri, (continued)											
Tramway, conveyor, and private railroad, total	-	-	-	3/	-	-	-	-	-	-	-
Electric utilities	-	-	-	3/	-	-	-	-	-	-	-
North and South Dakota, total	-	-	-	-	-	3	-	294	-	3,117	-
All methods of movement:	-	-	-	-	-	-	-	200	-	2,418	-
Electric utilities	-	-	-	-	-	3	-	29	-	292	-
Retail dealers	-	-	-	-	-	-	-	25	-	407	-
All others	-	-	-	-	-	-	-	-	-	-	-
All-rail, total	-	-	-	-	-	3	-	294	-	1,966	-
Electric utilities	-	-	-	-	-	-	-	200	-	1,387	-
Retail dealers	-	-	-	-	-	3	-	29	-	235	-
All others	-	-	-	-	-	-	-	25	-	406	-
Great Lakes, total	-	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-	-
Truck, total	-	-	-	-	-	-	-	-	-	1,151	-
Electric utilities	-	-	-	-	-	-	-	-	-	1,091	-
Retail dealers	-	-	-	-	-	-	-	-	-	59	-
All others	-	-	-	-	-	-	-	-	-	1	-
Tramway, conveyor, and private railroad, total	-	-	-	-	-	-	-	-	-	3/	-
Electric utilities	-	-	-	-	-	-	-	-	-	3/	-
Nebraska and Kansas, total	-	-	-	1,113	-	31	-	108	-	-	-
All methods of movement:	-	-	-	-	-	-	-	-	-	-	-
Electric utilities	-	-	-	861	-	31	-	3	-	-	-
Retail dealers	-	-	-	10	-	-	-	-	-	-	-
All others	-	-	-	242	-	-	-	105	-	-	-
All-rail, total	-	-	-	921	-	31	-	108	-	-	-
Electric utilities	-	-	-	861	-	-	-	-	-	-	-
Retail dealers	-	-	-	7	-	31	-	3	-	-	-
All others	-	-	-	125	-	-	-	105	-	-	-
Truck, total	-	-	-	122	-	-	-	-	-	-	-
Retail dealers	-	-	-	5	-	-	-	-	-	-	-
All others	-	-	-	119	-	-	-	-	-	-	-

See footnotes at end of table.

TABLE 1 - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)

(In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN <sup>1</sup>										12 thru 25
		1	2	3 and 6	4	7	8	9	10	11		
<b>South Atlantic</b>												
Delaware and Maryland, total	14,994	6,495	412	5,324	-	728	1,795	-	-	-	-	-
All methods of movement:												
Electric utilities	8,713	5,273	179	5,217	-	-	44	-	-	-	-	-
Coal and gas plants	5,995	790	197	2,019	-	660	1,727	-	-	-	-	-
Retail dealers	95	15	-	6	-	35	9	-	-	-	-	-
All others	755	417	36	282	-	5	15	-	-	-	-	-
All-rail, total	7,098	5,266	412	5,324	-	68	1,795	-	-	-	-	-
Electric utilities	5,876	4,181	179	5,217	-	-	44	-	-	-	-	-
Coal and gas plants	511	790	197	2,019	-	-	1,727	-	-	-	-	-
Retail dealers	78	-	-	-	-	65	9	-	-	-	-	-
All others	653	295	36	282	-	5	15	-	-	-	-	-
Tidewater, total	6,627	5	5	5	-	660	5	-	-	-	-	-
Electric utilities	1,715	5	5	5	-	660	5	-	-	-	-	-
Coal and gas plants	4,882	-	-	-	-	-	-	-	-	-	-	-
Truck, total	1,229	1,229	-	-	-	-	-	-	-	-	-	-
Electric utilities	1,092	1,092	-	-	-	-	-	-	-	-	-	-
Retail dealers	15	15	-	-	-	-	-	-	-	-	-	-
All others	122	122	-	-	-	-	-	-	-	-	-	-
District of Columbia, total	886	597	17	4	-	127	81	-	-	-	-	-
All methods of movement:												
Electric utilities	546	447	-	4	-	95	-	-	-	-	-	-
Retail dealers	69	69	-	-	-	89	-	-	-	-	-	-
All others	251	150	17	-	-	5	81	-	-	-	-	-
All-rail, total	886	597	17	4	-	127	81	-	-	-	-	-
Electric utilities	546	447	17	4	-	95	-	-	-	-	-	-
Retail dealers	69	69	-	-	-	89	-	-	-	-	-	-
All others	251	150	17	-	-	5	81	-	-	-	-	-
Virginia, total	24,894	36	-	-	-	1,886	12,992	-	-	-	-	-
All methods of movement:												
Electric utilities	8,896	-	-	-	-	811	8,085	-	-	-	-	-
Coal and gas plants	72	-	-	-	-	9	65	-	-	-	-	-
Retail dealers	753	17	-	-	-	288	448	-	-	-	-	-
All others	5,155	19	-	-	-	718	4,396	-	-	-	-	-
All-rail, total	14,600	-	-	-	-	-	-	-	-	-	-	-
Electric utilities	8,896	-	-	-	-	1,751	12,834	-	-	-	-	-
Coal and gas plants	72	-	-	-	-	811	8,085	-	-	-	-	-
Retail dealers	72	-	-	-	-	9	65	-	-	-	-	-
All others	5,055	15	-	-	-	218	4,381	-	-	-	-	-

See footnotes at end of table.



TABLE 2 - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)  
(In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN											
		1	2	3 and 6	4	7	8	9	10	11	12 thru 23		
Virginia, (continued)													
Truck, total	294	21	-	-	-	-	128	-	-	-	-		
Retail dealers	154	17	-	-	-	-	87	-	-	-	-		
All others	100	4	-	-	-	5	91	-	-	-	-		
West Virginia, total	25,284	2,048	5,879	6,399	1,375	1,160	8,385	-	-	-	-		
All methods of movements:	12,671	2,046	-	5,038	1,011	-	4,576	-	-	-	-		
Electric utilities	4,885	3,468	-	278	-	752	587	-	-	-	-		
Coal and gas plants	4,592	-	-	177	3	207	103	-	-	-	-		
Retail dealers	5,295	-	411	1,006	561	201	5,317	-	-	-	-		
All others	5,915	-	-	-	-	-	-	-	-	-	-		
All-rail, total	2,487	1,851	147	878	-	374	2,685	-	-	-	-		
Electric utilities	256	1,889	-	155	-	-	503	-	-	-	-		
Coal and gas plants	259	-	-	-	-	37	180	-	-	-	-		
Retail dealers	239	-	-	-	-	137	2,128	-	-	-	-		
All others	2,835	-	147	-	-	-	-	-	-	-	-		
River and ex-river, total	12,566	-	5,468	1,893	827	699	5,489	-	-	-	-		
Electric utilities	6,185	-	1,609	565	-	-	4,009	-	-	-	-		
Coal and gas plants	4,977	-	5,468	-	-	695	334	-	-	-	-		
Retail dealers	50	-	-	-	-	-	22	-	-	-	-		
All others	1,656	-	-	274	268	4	1,116	-	-	-	-		
Truck, total	4,965	217	204	3,658	518	87	209	-	-	-	-		
Electric utilities	4,001	217	-	3,274	446	-	64	-	-	-	-		
Coal and gas plants	32	-	-	-	-	-	-	-	-	-	-		
Retail dealers	125	-	-	564	99	27	145	-	-	-	-		
All others	807	-	264	-	-	60	-	-	-	-	-		
Tramway, conveyor, and private railroad, total	17,515	-	-	-	-	17	-	-	-	-	-		
Electric utilities	14,349	-	-	-	-	17	-	-	-	-	-		
All others	2,550	-	-	-	-	-	-	-	-	-	-		
North Carolina, total	17,515	10	-	-	-	1,009	16,496	-	-	-	-		
All methods of movements:	14,349	-	-	-	-	882	13,467	-	-	-	-		
Electric utilities	2,550	-	-	-	-	34	608	-	-	-	-		
Retail dealers	2,550	-	-	-	-	95	2,427	-	-	-	-		
All others	17,508	10	-	-	-	1,009	16,489	-	-	-	-		
Electric utilities	14,349	-	-	-	-	882	13,467	-	-	-	-		
Retail dealers	631	-	-	-	-	34	597	-	-	-	-		
All others	2,528	10	-	-	-	95	2,425	-	-	-	-		

See footnotes at end of table.

TABLE 1 - DISTRIBUTION OF BITUMINOUS COAL AND LUMBERT PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.) (In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF COLUMBIA										17 and 18 (Apr 20)
		1	2	3 and 6	4	7	8	9	10	11	13	
North Carolina, (continued)												
Truck, total	7	-	-	-	-	-	7	-	-	-	-	-
Retail dealers	5	-	-	-	-	-	5	-	-	-	-	-
All others	2	-	-	-	-	-	2	-	-	-	-	-
South Carolina, total	5,594	-	-	-	-	30	5,564	-	-	-	-	-
All methods of movement:	5,677	-	-	-	-	19	5,658	-	-	-	-	-
Electric utilities	269	-	-	-	-	-	269	-	-	-	-	-
Retail dealers	1,408	-	-	-	-	11	1,397	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-	-	-
All-rail, total	5,594	-	-	-	-	30	5,564	-	-	-	-	-
Electric utilities	5,677	-	-	-	-	19	5,658	-	-	-	-	-
Retail dealers	269	-	-	-	-	-	269	-	-	-	-	-
All others	1,408	-	-	-	-	11	1,397	-	-	-	-	-
Georgia and Florida, total	11,498	-	-	-	-	-	6,130	5,099	-	-	285	-
All methods of movement:	10,319	-	-	-	-	-	5,331	5,099	-	-	129	-
Electric utilities	177	-	-	-	-	-	170	-	-	-	147	-
Retail dealers	796	-	-	-	-	-	649	-	-	-	285	-
All others	-	-	-	-	-	-	-	-	-	-	-	-
All-rail, total	7,289	-	-	-	-	-	6,130	796	-	-	285	-
Electric utilities	6,256	-	-	-	-	-	5,331	796	-	-	129	-
Retail dealers	177	-	-	-	-	-	170	-	-	-	147	-
All others	796	-	-	-	-	-	649	-	-	-	-	-
River and se-river, total	4,265	-	-	-	-	-	-	4,265	-	-	-	-
Electric utilities	4,265	-	-	-	-	-	-	4,265	-	-	-	-
East South Central												
Kentucky, total	19,046	-	-	-	-	431	3,677	12,498	2,446	-	-	-
All methods of movement:	18,087	-	-	-	-	-	2,674	10,136	2,477	-	-	-
Electric utilities	1,595	-	-	-	-	303	1,581	194	-	-	-	-
Coal and gas plants	1,595	-	-	-	-	-	1,581	194	-	-	-	-
Retail dealers	4,488	-	-	-	-	42	282	230	-	-	-	-
All others	2,505	-	-	-	-	-	360	1,938	169	-	-	-

See footnotes at end of table.

TABLE 1 - DISTRIBUTION OF PITTSBURGH COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1957 (cont.) (In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN 1/										
		1	2	3 and 6	4	7	8	9	10	11	13	12 and 14 thru 22
Kentucky, (continued)												
All-rail, total	11,706	-	-	-	-	431	3,377	7,306	2,446	-	-	-
Electric utilities	8,336	-	-	-	-	-	1,674	5,428	2,277	-	-	-
Coal and gas plants	685	-	-	-	-	383	1,581	169	-	-	-	-
Retail dealers	300	-	-	-	-	8	227	-	-	-	-	-
All others	2,313	-	-	-	-	42	295	1,709	169	-	-	-
River and ex-river, total	2,094	-	-	-	-	2	2	2	2	-	-	-
Electric utilities	681	-	-	-	-	2	2	-	-	-	-	-
Coal and gas plants	1,079	-	-	-	-	2	2	-	-	-	-	-
Retail dealers	12	-	-	-	-	-	-	-	-	-	-	-
All others	102	-	-	-	-	-	-	-	-	-	-	-
Truck, total	2,266	-	-	-	-	-	100	2,186	-	-	-	-
Electric utilities	4,708	-	-	-	-	-	-	4,180	-	-	-	-
Coal and gas plants	194	-	-	-	-	-	-	134	-	-	-	-
Retail dealers	96	-	-	-	-	-	22	61	-	-	-	-
All others	288	-	-	-	-	-	55	233	-	-	-	-
Tennessee, total	18,185	-	-	-	-	102	9,809	7,296	92	-	886	-
All methods of movement:												
Electric utilities	14,777	-	-	-	-	-	7,669	6,375	46	-	691	-
Coal and gas plants	274	-	-	-	-	66	108	106	-	-	44	-
Retail dealers	275	-	-	-	-	-	405	106	-	-	151	-
All others	2,079	-	-	-	-	36	1,631	815	46	-	-	-
All-rail, total	12,032	-	-	-	-	102	8,196	7,289	46	-	648	-
Electric utilities	8,862	-	-	-	-	-	6,096	6,375	-	-	643	-
Coal and gas plants	374	-	-	-	-	66	108	100	-	-	5	-
Retail dealers	440	-	-	-	-	-	375	100	-	-	-	-
All others	2,513	-	-	-	-	36	1,617	814	46	-	-	-
River and ex-river, total	4,298	-	-	-	-	-	-	2	46	-	2	-
Electric utilities	4,298	-	-	-	-	-	-	2	46	-	2	-
Truck, total	1,858	-	-	-	-	-	-	-	-	-	-	-
Electric utilities	1,617	-	-	-	-	-	-	-	-	-	-	-
Retail dealers	72	-	-	-	-	-	-	-	-	-	-	-
All others	166	-	-	-	-	-	-	-	-	-	-	-

See footnotes at end of table.

TABLE 1 - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)  
(In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN									
		1	2	3 and 6	4	7	8	9	10	11	
Alabama and Mississippi, total	24,061	-	-	-	-	554	2,799	6,909	21	-	
All methods of movement:	14,590	-	-	-	-	-	-	-	-	-	
Electric utilities	7,958	-	-	-	-	377	1,503	6,235	21	-	
Coal and gas plants	37	-	-	-	-	-	-	5	-	-	
Retail dealers	1,502	-	-	-	-	177	141	669	-	-	
All others	-	-	-	-	-	-	-	-	-	-	
All-rail, total	15,387	-	-	-	-	554	2,799	6,909	-	-	
Electric utilities	7,958	-	-	-	-	377	1,503	6,235	-	-	
Coal and gas plants	7,862	-	-	-	-	-	-	-	-	-	
Retail dealers	69	-	-	-	-	-	-	-	-	-	
All others	409	-	-	-	-	177	141	669	-	-	
River and ex-river, total	7,098	-	-	-	-	37	141	37	21	-	
Electric utilities	6,088	-	-	-	-	37	-	37	21	-	
All others	970	-	-	-	-	-	-	-	-	-	
Truck, total	1,696	-	-	-	-	-	-	-	-	-	
Electric utilities	247	-	-	-	-	-	-	-	-	-	
Coal and gas plants	28	-	-	-	-	-	-	-	-	-	
Retail dealers	43	-	-	-	-	-	-	-	-	-	
All others	-	-	-	-	-	-	-	-	-	-	
Tramway, conveyor, and private railroad, total	37	-	-	-	-	-	-	-	-	-	
Electric utilities	37	-	-	-	-	-	-	-	-	-	
West South Central	-	-	-	-	-	-	-	-	-	-	
Arkansas, Louisiana, Oklahoma, and Texas, total	995	-	-	-	-	48	227	17	5	-	
All methods of movement:	822	-	-	-	-	48	227	13	5	-	
Coal and gas plants	23	-	-	-	-	-	-	-	-	-	
Retail dealers	110	-	-	-	-	-	227	13	5	-	
All others	-	-	-	-	-	-	-	-	-	-	
All-rail, total	691	-	-	-	-	48	227	17	5	-	
Coal and gas plants	567	-	-	-	-	48	227	13	5	-	
Retail dealers	214	-	-	-	-	-	-	-	-	-	
All others	110	-	-	-	-	-	227	13	5	-	
River and ex-river, total	295	-	-	-	-	37	141	37	-	-	
Coal and gas plants	295	-	-	-	-	37	141	37	-	-	
All others	-	-	-	-	-	-	-	-	-	-	
Truck, total	9	-	-	-	-	-	-	-	-	-	
Retail dealers	9	-	-	-	-	-	-	-	-	-	

See footnotes at end of table.

TABLE 1 - DISTRIBUTION OF BYPRODUCTS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1961 (cont.)

(In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT COMMODITY USE	ABSTRACT OF COLUMNS 1/									
	12	13	14	15 Rail-Tel.	16	17	18	19	20	21
<b>Arkansas and Mississippi, total (cont.)</b>	-	14,450	-	-	-	-	-	-	-	-
All methods of movement:	-	8,186	-	-	-	-	-	-	-	-
Electric utilities	-	6,092	-	-	-	-	-	-	-	-
Coal and gas plants	-	85	-	-	-	-	-	-	-	-
Retail dealers	-	515	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-
<b>All-rail, total</b>	-	13,000	-	-	-	-	-	-	-	-
Electric utilities	-	6,711	-	-	-	-	-	-	-	-
Coal and gas plants	-	5,860	-	-	-	-	-	-	-	-
Retail dealers	-	377	-	-	-	-	-	-	-	-
All others	-	470	-	-	-	-	-	-	-	-
<b>River and ex-river, total</b>	-	2	-	-	-	-	-	-	-	-
Electric utilities	-	2	-	-	-	-	-	-	-	-
All others	-	2	-	-	-	-	-	-	-	-
<b>Truck, total</b>	-	1,656	-	-	-	-	-	-	-	-
Electric utilities	-	1,075	-	-	-	-	-	-	-	-
Coal and gas plants	-	281	-	-	-	-	-	-	-	-
Retail dealers	-	281	-	-	-	-	-	-	-	-
All others	-	43	-	-	-	-	-	-	-	-
<b>Tramway, conveyor, and private railroad, total</b>	-	2	-	-	-	-	-	-	-	-
Electric utilities	-	2	-	-	-	-	-	-	-	-
<b>West South Central</b>	-	-	-	-	-	-	-	-	-	-
Arkansas, Louisiana, Oklahoma, and Texas, total	-	84	435	139	-	-	-	-	-	-
All methods of movement:	-	-	435	139	-	-	-	-	-	-
Coal and gas plants	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-
<b>All-rail, total</b>	-	84	435	139	-	-	-	-	-	-
Coal and gas plants	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-
<b>River and ex-river, total</b>	-	2	-	-	-	-	-	-	-	-
Coal and gas plants	-	2	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-
<b>Truck, total</b>	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-

See footnotes at end of table.



TABLE 1 - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1947 (cont.)

GEOGRAPHIC DIVISION STATE OF ORIGIN METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN									
		1	2	3 and 6	4	7	8	9	10	11	
Mountain											
Colorado, total	4,780										
All methods of movement:											
Electric utilities	2,919										
Coal and gas plants	1,057										
Retail dealers	689										
All others	655										
All-rail, total	3,516										
Electric utilities	1,945										
Coal and gas plants	1,057										
Retail dealers	105										
All others	409										
Truck, total	3,806										
Electric utilities	976										
Retail dealers	185										
All others	146										
Tramway, conveyor, and private railroad, total	4										
Electric utilities	4										
Utah, total	2,855										
All methods of movement:											
Electric utilities	479										
Coal and gas plants	1,865										
Retail dealers	195										
All others	316										
All-rail, total	2,875										
Electric utilities	107										
Coal and gas plants	1,865										
Retail dealers	65										
All others	818										
Truck, total	570										
Electric utilities	279										
Retail dealers	100										
All others	96										
Tramway, conveyor, and private railroad, total	4										
Electric utilities	4										

See footnotes at end of table.

TABLE 1 - DISTRIBUTION OF BITUMINOUS COAL AND LUMITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1947 (cont.)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	DISTRICT OF ORIGIN									
	12	13	14	15 Mid. West	16	17	18	19	20	20423
<u>Mountain (continued)</u>										
Colorado, total					669	5,696		399		
All methods of movement:										
Electric utilities					549	2,040		330		
Coal and gas plants					1,097	1,097				
Retail dealers					65	846				
All others					77	515		69		
All-rail, total					437	2,682		399		
Electric utilities					398	1,217		330		
Coal and gas plants					-	1,097				
Retail dealers					-	105				
All others					39	505		69		
Truck, total					232	974				
Electric utilities					151	823				
Retail dealers					45	145				
All others					36	6				
Tramway, conveyor, and private railroad, total					-	-				
Electric utilities					-	-				
Utah, total					-	1,006		119	1,174	
All methods of movement:										
Electric utilities					-	1,006		-	1,358	
Coal and gas plants					-	-		-	192	
Retail dealers					-	-		112	204	
All others					-	-		-	-	
All-rail, total					-	1,006		119	1,156	
Electric utilities					-	1,006		-	966	
Coal and gas plants					-	-		-	84	
Retail dealers					-	-		112	106	
All others					-	-		-	-	
Truck, total					-	-		-	578	
Electric utilities					-	-		-	372	
Retail dealers					-	-		-	100	
All others					-	-		-	98	
Tramway, conveyor, and private railroad, total					-	-		-	-	
Electric utilities					-	-		-	-	

See footnotes at end of table.

TABLE 1 - DISTRIBUTION OF BITUMINOUS COAL AND LUMBER PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.) (In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN 1/											
		1 thru 11	12	13	14	15 N.H., Tex.	16	17	18	19	20	21	22a, 23
Montana and Idaho, total	568	-	-	-	-	-	-	-	-	172	427	-	569
All methods of movement:	568	-	-	-	-	-	-	-	-	-	-	-	568
Electric utilities	427	-	-	-	-	-	-	-	-	50	577	-	508
Retail dealers	215	-	-	-	-	-	-	-	-	162	50	-	21
All others	-	-	-	-	-	-	-	-	-	-	-	-	-
All-rail, total	676	-	-	-	-	-	-	-	-	172	572	-	555
Electric utilities	527	-	-	-	-	-	-	-	-	-	-	-	527
Retail dealers	253	-	-	-	-	-	-	-	-	50	521	-	2
All others	196	-	-	-	-	-	-	-	-	162	50	-	6
Truck, total	90	-	-	-	-	-	-	-	-	-	56	-	34
Electric utilities	1	-	-	-	-	-	-	-	-	-	-	-	1
Retail dealers	74	-	-	-	-	-	-	-	-	-	56	-	18
All others	15	-	-	-	-	-	-	-	-	-	-	-	15
Byproduct, total	2,494	-	-	-	-	-	-	3	-	2,491	-	-	-
All methods of movement:	2,494	-	-	-	-	-	-	-	-	2,491	-	-	-
Electric utilities	-	-	-	-	-	-	-	-	-	-	-	-	-
Coke and gas plants	48	-	-	-	-	-	-	3	-	25	-	-	-
Retail dealers	175	-	-	-	-	-	-	-	-	175	-	-	-
All others	-	-	-	-	-	-	-	-	-	-	-	-	-
All-rail, total	446	-	-	-	-	-	-	3	-	443	-	-	-
Electric utilities	258	-	-	-	-	-	-	-	-	-	-	-	-
Coke and gas plants	-	-	-	-	-	-	-	-	-	258	-	-	-
Retail dealers	48	-	-	-	-	-	-	-	-	-	-	-	-
All others	140	-	-	-	-	-	-	3	-	25	-	-	-
Truck, total	2,048	-	-	-	-	-	-	-	-	160	-	-	-
Electric utilities	15	-	-	-	-	-	-	-	-	2,048	-	-	-
All others	-	-	-	-	-	-	-	-	-	2,033	-	-	-
Tramway, conveyor, and private railroad, total	5	-	-	-	-	-	-	-	-	5	-	-	-
Electric utilities	5	-	-	-	-	-	-	-	-	5	-	-	-

See footnotes at end of table.

TABLE 1 - DISTRIBUTION OF BITUMINOUS COAL AND LUMBER PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.) (In thousand net tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF COLUMBIA											
		1 thru 11	12	13	14	15 Bal. Yr.	16	17	18	19	20	21	22a23
New Mexico, total	2,506	-	-	-	-	-	-	-	2,506	-	-	-	-
All methods of movement:	2,506	-	-	-	-	-	-	-	2,506	-	-	-	-
Electric utilities	5	-	-	-	-	-	-	-	5	-	-	-	-
Retail dealers	17	-	-	-	-	-	-	-	17	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-	-	-	-
All-rail, total	-	-	-	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-	-	-	-
Truck, total	2,506	-	-	-	-	-	-	-	2,506	-	-	-	-
Electric utilities	2,506	-	-	-	-	-	-	-	2,506	-	-	-	-
Retail dealers	5	-	-	-	-	-	-	-	5	-	-	-	-
All others	17	-	-	-	-	-	-	-	17	-	-	-	-
Arizona and Nevada, total	700	-	-	-	-	-	-	-	568	-	538	-	-
All methods of movement:	661	-	-	-	-	-	-	-	556	-	505	-	-
Electric utilities	25	-	-	-	-	-	-	-	-	-	25	-	-
Retail dealers	14	-	-	-	-	-	-	-	12	-	2	-	-
All others	-	-	-	-	-	-	-	-	-	-	-	-	-
All-rail, total	700	-	-	-	-	-	-	-	568	-	538	-	-
Electric utilities	661	-	-	-	-	-	-	-	556	-	505	-	-
Retail dealers	25	-	-	-	-	-	-	-	-	-	25	-	-
All others	14	-	-	-	-	-	-	-	12	-	2	-	-
Pacific													
Washington and Oregon, total	941	-	-	-	-	-	-	-	-	22	456	-	59
All methods of movement:	101	-	-	-	-	-	-	-	-	22	149	-	16
Retail dealers	350	-	-	-	-	-	-	-	-	22	307	-	45
All others	-	-	-	-	-	-	-	-	-	-	-	-	-
All-rail, total	505	-	-	-	-	-	-	-	-	22	456	-	21
Retail dealers	175	-	-	-	-	-	-	-	-	22	149	-	21
All others	308	-	-	-	-	-	-	-	-	22	307	-	-
Truck, total	98	-	-	-	-	-	-	-	-	-	-	-	38
Retail dealers	16	-	-	-	-	-	-	-	-	-	-	-	16
All others	22	-	-	-	-	-	-	-	-	-	-	-	22

See footnotes at end of table.

TABLE 1 - DISTRIBUTION OF BITUMINOUS COAL AND LUMBER PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE		TOTAL	DISTRICT OF ORIGIN <sup>1/</sup>							
			1	2	3 and 6	4	7	8	9	10
California, total										
All methods of movement:										
Coke and gas plants										
Retail dealers										
All others										
All-rail, total										
Coke and gas plants										
Retail dealers										
All others										
Alaska, total										
All methods of movement:										
Electric utilities										
Retail dealers										
All others										
All-rail, total										
Electric utilities										
Retail dealers										
All others										
Trunk, total										
All others										
Canada, total										
All methods of movement:										
Electric utilities										
Coke and gas plants										
Retail dealers										
All others										
All-rail, total										
Electric utilities										
Coke and gas plants										
Retail dealers										
All others										
Great Lakes, total										
Electric utilities										
Coke and gas plants										
Retail dealers										
All others										
Tennessee, total										
Retail dealers										
All others										

See footnotes at end of table.



TABLE 1 - DISTRIBUTION OF BITUMINOUS COAL AND LUMBER PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)  
(In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	DISPENSE OF ORIGIN $\frac{1}{2}$										20	21	22
	12	13	14	15 Rec.L. Tex.	16	17	18	19	20	21			
California, total (continued)						813	4		1,099				
All methods of movement:													
Coke and gas plants													
Retail dealers						813	4		1,099				
All others													
All-rail, total						813	4		1,099				
Coke and gas plants													
Retail dealers						813	4		1,099				
All others													
Alaska, total													
All methods of movement:													
Electric utilities													
Retail dealers													
All others													
All-rail, total													
Electric utilities													
Retail dealers													
All others													
Trunk, total													
All others													
Canada, total													
All methods of movement:													
Electric utilities													
Coke and gas plants													
Retail dealers													
All others													
All-rail, total													
Electric utilities													
Coke and gas plants													
Retail dealers													
All others													
Great Lakes, total													
Electric utilities													
Coke and gas plants													
Retail dealers													
All others													
Tidecenter, total													
Retail dealers													
All others													

See footnotes at end of table.

TABLE 1 - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)

(In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN 1/										
		1	2	3 and 6	4	7	8	9	10	11		
Mexico, total	60	-	-	-	-	-	-	-	-	-		
All methods of movement:	60	-	-	-	-	-	-	-	-	-		
All others	60	-	-	-	-	-	-	-	-	-		
All-rail, total	60	-	-	-	-	-	-	-	-	-		
All others	60	-	-	-	-	-	-	-	-	-		
<u>Destinations Not Revealed</u>	994	107	89	75	10	121	254	21	125	169		
All methods of movement:	487	66	32	32	1	121	254	21	99	154		
Electric utilities	120	10	48	35	8	121	254	21	4	7		
Coke and gas plants	49	4	2	1	9	121	254	21	20	8		
Retail dealers	296	87	15	1	9	121	254	21	4	50		
All others	440	19	50	5	5	111	185	9	4	10		
All-rail, total	150	10	16	2	2	111	185	2	4	50		
Electric utilities	66	2	1	1	2	111	185	2	4	50		
Coke and gas plants	23	2	1	1	2	111	185	2	4	50		
Retail dealers	202	8	15	1	1	111	185	2	4	50		
All others	285	-	-	-	-	-	-	-	-	-		
River and ex-river, total	207	-	-	-	-	-	-	-	-	-		
Electric utilities	56	-	-	-	-	-	-	-	-	-		
Coke and gas plants	6	-	-	-	-	-	-	-	-	-		
Retail dealers	32	-	-	-	-	-	-	-	-	-		
All others	137	67	-	-	-	-	-	-	-	-		
Great Lakes, total	86	50	-	-	-	-	-	-	-	-		
Electric utilities	7	-	-	-	-	-	-	-	-	-		
Coke and gas plants	16	-	-	-	-	-	-	-	-	-		
Retail dealers	26	17	-	-	-	-	-	-	-	-		
All others	105	19	53	4	-	-	-	-	-	-		
Tidewater, total	44	16	12	-	-	-	-	-	-	-		
Electric utilities	45	1	37	-	-	-	-	-	-	-		
Coke and gas plants	1	-	-	-	-	-	-	-	-	-		
Retail dealers	15	8	-	-	-	-	-	-	-	-		
All others	29	2	6	1	-	-	-	-	-	-		
Trust, total	5	-	-	-	-	-	-	-	-	-		
Electric utilities	5	-	-	-	-	-	-	-	-	-		
Coke and gas plants	1	-	-	-	-	-	-	-	-	-		
Retail dealers	25	2	-	-	-	-	-	-	-	-		
All others	25	-	-	-	-	-	-	-	-	-		

See footnotes at end of table.

TABLE 1 - DISTRIBUTION OF STEAMSHIPS COAL AND LUMBER PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)

(In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF ORIGIN METHOD OF MOVEMENT CONSUMER USE	DISTRICT OF ORIGIN									
	12	13	14	15 Natl. Tot.	16	17	18	19	20	21
Mexico, total (continued)	-	-	62	-	-	-	-	-	-	-
All methods of movement:	-	-	62	-	-	-	-	-	-	-
All others	-	-	62	-	-	-	-	-	-	-
All-rail, total	-	-	62	-	-	-	-	-	-	-
All others	-	-	62	-	-	-	-	-	-	-
Destinations Not Revealed	-	3	-	-	-	1	1	31	-	1
All methods of movement:	-	-	-	-	-	-	-	-	-	-
Electric utilities	-	-	-	-	-	-	-	-	-	-
Coke and gas plants	-	3	-	-	-	1	-	27 <sup>b</sup>	-	1
Retail dealers	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-
All-rail, total	-	-	-	-	-	-	-	-	-	-
Electric utilities	-	-	-	-	-	-	-	-	-	-
Coke and gas plants	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-
River and se-river, total	-	3	-	-	-	1	-	31	-	1
Electric utilities	-	-	-	-	-	-	-	-	-	-
Coke and gas plants	-	3	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	1	-	27 <sup>b</sup>	-	1
All others	-	-	-	-	-	-	-	-	-	-
Great Lakes, total	-	-	-	-	-	-	-	-	-	-
Electric utilities	-	-	-	-	-	-	-	-	-	-
Coke and gas plants	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-
Tidewater, total	-	-	-	-	-	-	-	-	-	-
Electric utilities	-	-	-	-	-	-	-	-	-	-
Coke and gas plants	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-
Truck, total	-	-	-	-	-	-	-	-	-	-
Electric utilities	-	-	-	-	-	-	-	-	-	-
Coke and gas plants	-	-	-	-	-	-	-	-	-	-
Retail dealers	-	-	-	-	-	-	-	-	-	-
All others	-	-	-	-	-	-	-	-	-	-

See footnotes at end of table.

TABLE 1 - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	TOTAL	DISTRICT OF ORIGIN 1/									
		1	2	3 and 6	4	7	8	9	10	11	
<u>Destination and/or Consumer</u> <u>Area Not Available</u>											
Great Lakes movement:											
Canadian commercial docks	368	15	77	96	59	5	118	-	-	-	
Vessel fuel	878	2	318	35	42	-	472	2	4	-	
U.S. dock storage	-62	-2	-15	32	-147	119	-66	16	-41	-	
Tidewater movement:											
Overseas exports (except Canada)	34,174	1,559	-	714	-	15,708	16,415	-	-	-	
Rubber fuel	5	-	-	1	-	-	4	-	-	-	
U.S. dock storage	-	-	-	-5	-	14	-9	-	-	-	
Railroad fuel, total	1,179	191	5	40	159	151	255	52	160	115	
All methods of movement:											
United States companies	1,146	191	5	40	126	151	255	52	160	115	
Canadian companies	35	-	-	-	35	-	-	-	-	-	
Coal used at mines and sales to employees	1,678	455	24	20	32	628	596	-	45	9	
Net change in mine inventory	665	66	-41	62	140	441	-89	55	-42	16	

TABLE 1 - DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEAR OF 1967 (cont.)

(In Thousand Net Tons)

GEOGRAPHIC DIVISION STATE OF DESTINATION METHOD OF MOVEMENT CONSUMER USE	DISTRICT OF COLUMBIA										
	12	13	14	15 Mex.Tex.	16	17	18	19	20	21	22a23
<u>Destination and/or Consumer</u> <u>Uses Not Available (continued)</u>											
Great Lakes movement:											
Canadian commercial docks	-	-	-	-	-	-	-	-	-	-	-
Vessel fuel	-	-	-	-	-	-	-	-	-	-	-
U.S. dock storage	-	-	-	-	-	-	-	-	-	-	-
Tidewater movement:											
Overseas exports (except Canada)	-	-	-	-	-	-	-	-	-	-	-
Bunker fuel	-	-	-	-	-	-	-	-	-	-	-
U.S. dock storage	-	-	-	-	-	-	-	-	-	-	-
Railroad fuel, total											
All methods of movement:											
United States companies	-	-	-	-	-	-	-	-	-	-	-
Canadian companies	-	-	-	-	-	-	-	-	-	-	-
Coal used at mines and sales to employees	-	2	-	-	4	2	-	2	31	26	4
Net change in mine inventory	-	-5	-	-28	2	21	-7	-	18	76	-

**FOOTNOTES** (Where special combinations of consumer uses, methods of movement, States of destination, etc., are shown in footnotes, it is for purposes of concealment of individual respondent figures)

- 1/ For definitions of bituminous coal and lignite producing districts, see page 3.
- 2/ Excludes shipments to Canadian Great Lakes commercial docks and United States dock storage for which consumer uses are not available; however, includes vessel fuel, the destinations of which are not available.
- 3/ Excludes overseas exports and United States tidewater dock storage for which consumer uses are not available; however, includes bunker fuel, the destinations of which are not available.
- 4/ Shipments via tramway, conveyor, and private railroad are included with truck shipments.
- 5/ Shipments via river and ex-river are included with all-rail shipments.
- 6/ Shipments via tidewater are included with all-rail shipments.
- 7/ Shipments via Great Lakes are included with all-rail shipments.

TABLE II - COMPARATIVE SUMMARY OF DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEARS OF 1967 AND 1966, BY GEOGRAPHIC DIVISION AND STATE DESTINATION, METHOD OF MOVEMENT, AND CONSUMER USE.

GEOGRAPHIC DIVISION STATE OF ORIGIN METHOD OF MOVEMENT CONSUMER USE	(In Thousands Net Tons of 2,000 Pounds)									
	TOTAL		ELECTRIC UTILITIES		COKE AND GAS PLANTS		RETAIL DEALERS		ALL OTHERS	
	Calendar Year	Calendar Year	Calendar Year	Calendar Year	Calendar Year	Calendar Year	Calendar Year	Calendar Year	Calendar Year	Calendar Year
	1967	1966	1967	1966	1967	1966	1967	1966	1967	1966
Shipments to all destinations in United States, Canada, and Mexico, by all modes of transport, net change in inventory, net change in mine and sales to employees, net change in inventory, net change in stockpile (exclusive of Canada - consumer use not available)	552,647 1,179	532,366 1,308	296,177	277,616	99,786	100,370	18,769	20,664	99,895	101,866
Railroad fuel										
Canadian Great Lakes commercial docks (consumer use not available)	368	428	-	-	-	-	-	-	-	-
U.S. Great Lakes dock storage (consumer use not available)	-62	-6	-	-	-	-	-	-	-	-
U.S. tidewater dock storage (consumer use not available)	-	-	-	-	-	-	-	-	-	-
Coal used at mines and sales to employees	1,678	2,098	-	-	-	-	-	-	-	-
Net change in mine inventory	665	251	-	-	-	-	-	-	-	-
Overseas exports (exclusive of Canada - consumer use not available)	34,174	33,527	-	-	-	-	-	-	-	-
Shipments to all destinations in United States, Canada, and Mexico, by specific method of movement and consumer use (exclusive of railroad fuel, Canadian Great Lakes commercial docks, U.S. Great Lakes and tidewater dock storage, coal used at mines and sales to employees, net change in inventory, and overseas exports)	276,800	262,678	152,940	136,166	50,951	49,685	10,984	12,657	61,995	65,890
All-rail										
River and ex-river	99,396	92,731	63,296	56,708	27,959	28,077	1,845	891	6,896	7,078
Great Lakes	53,078	55,395	23,947	23,384	13,456	15,274	3,173	3,520	12,502	13,127
Tidewater	21,370	23,080	14,527	16,243	6,266	6,122	-	21	373	694
Truck	47,597	45,601	25,119	23,553	1,154	1,412	3,383	5,625	17,941	17,001
Tramway, conveyor, and private railroad	16,406	15,861	16,348	15,185	-	-	-	-	58	76



TABLE II - COMPARATIVE SUMMARY OF DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEARS OF 1967 AND 1966 (continued) (In Thousand Net Tons)

GEOGRAPHIC DIVISION STATES OF ORIGIN METHOD OF MOVEMENT CONSUMER USE	TOTAL Calendar Year		ELECTRIC UTILITIES Calendar Year		COKE AND GAS PLANTS Calendar Year		RETAIL DEALERS Calendar Year		ALL OTHERS Calendar Year	
	1967	1966	1967	1966	1967	1966	1967	1966	1967	1966
<b>NEW England, total</b>	9,741	10,877	8,167	9,498	485	454	186	186	967	779
Massachusetts	4,082	4,415	2,418	4,019	-	-	110	109	464	287
Connecticut	4,755	5,454	4,030	4,675	485	454	112	112	464	287
Maine, New Hampshire, Vermont and Rhode Island	906	1,028	719	764	-	-	42	65	165	199
<b>Middle Atlantic, total</b>	96,562	95,913	44,037	42,037	33,899	33,900	963	1,093	17,234	17,283
New York	27,300	25,314	14,230	12,487	5,882	5,882	169	280	6,885	6,095
New Jersey	7,665	7,662	7,151	7,151	460	511	15	16	927	1,014
Pennsylvania	61,597	59,937	22,599	22,599	27,107	27,107	761	817	9,428	9,584
<b>East North Central, total</b>	196,417	192,451	108,170	100,760	30,468	35,577	10,734	11,702	45,045	46,192
Ohio	58,796	57,622	30,086	28,321	11,610	12,320	2,191	2,190	14,892	14,741
Indiana	46,141	45,146	24,687	23,687	12,423	12,423	1,070	1,065	6,466	6,415
Illinois	46,714	45,480	24,687	23,687	12,423	12,423	1,070	1,065	6,466	6,415
Michigan	34,929	34,773	19,627	18,464	4,591	5,012	1,474	1,465	9,690	10,409
Wisconsin	15,581	15,053	8,298	7,987	497	465	1,914	2,115	2,778	2,463
<b>West North Central, total</b>	86,761	85,977	17,791	16,454	1,158	1,161	1,889	1,889	6,180	6,473
Minnesota	7,142	7,620	4,137	4,684	989	992	689	712	1,321	1,362
Iowa	2,749	2,440	2,227	2,915	395	442	442	442	1,967	2,085
Missouri	3,627	3,694	2,844	3,946	219	269	189	277	2,037	2,082
North Dakota and South Dakota	2,427	2,580	2,222	2,415	-	-	307	368	458	465
Nebraska and Kansas	1,254	1,267	681	798	-	-	46	60	547	511
<b>South Atlantic, total</b>	80,499	80,491	59,571	51,507	10,350	10,420	2,409	2,508	16,169	16,096
Delaware and Maryland	14,024	14,022	8,713	8,108	5,293	4,987	93	111	755	696
District of Columbia	886	897	546	497	-	-	89	101	299	299
Virginia	14,894	14,879	8,896	8,495	78	260	851	851	5,133	4,945
West Virginia	25,044	24,559	12,671	9,594	4,069	3,193	302	307	2,896	2,896
North Carolina	17,515	15,552	14,549	12,286	656	656	659	659	2,430	2,437
South Carolina	3,554	3,118	3,877	3,840	-	-	869	896	1,408	1,482
Georgia and Florida	11,492	10,604	10,519	9,597	-	-	177	225	796	784
<b>East South Central, total</b>	61,512	54,989	45,414	37,668	10,064	9,342	1,150	1,264	6,664	6,693
Kentucky	19,046	17,644	14,087	12,693	1,928	1,751	498	552	2,503	2,648
Tennessee	12,165	14,811	11,477	11,174	180	180	608	608	2,679	2,996
Alabama and Mississippi	26,081	22,474	13,546	7,934	7,934	7,411	104	104	1,502	1,411
<b>West South Central, total</b>	955	1,004	-	-	822	948	25	28	110	108
Arkansas, Louisiana, Oklahoma & Texas	955	1,004	-	-	822	948	25	28	110	108

TABLE II - COMPARATIVE SUMMARY OF DISTRIBUTION OF RETAILER'S COAL AND LUMBER PRODUCED IN THE UNITED STATES DURING THE CALENDAR YEARS OF 1967 AND 1966 (continued) (In thousand net tons)

GEOGRAPHIC DIVISION STATE OF ORIGIN METHOD OF MOVEMENT COMMERCE USE	TOTAL		ELECTRIC UTILITIES		COKE AND GAS PLANTS		RETAIL DEALERS		ALL OTHERS	
	Calendar Year		Calendar Year		Calendar Year		Calendar Year		Calendar Year	
	1967	1966	1967	1966	1967	1966	1967	1966	1967	1966
<b>Mountain, total</b>	14,463	14,090	9,152	8,694	2,908	3,163	967	1,044	2,100	1,107
Colorado	4,720	4,700	2,919	2,758	1,097	1,232	389	343	435	372
Utah	2,853	2,974	1,479	1,466	1,066	1,031	105	166	316	372
Montana and Idaho	965	995	348	390	-	-	147	377	215	293
Wyoming	2,494	2,601	2,391	2,437	-	-	26	39	175	125
New Mexico	2,586	2,098	2,504	2,004	-	-	5	7	17	15
Arizona and Nevada	700	779	663	664	-	-	25	92	14	23
<b>Pacific, total</b>	2,592	2,575	-	-	2,017	1,899	205	268	370	468
Washington and Oregon	441	627	-	-	-	-	191	254	350	433
California	2,051	1,948	-	-	2,017	1,899	14	14	20	335
Alaska	912	896	135	204	-	-	45	44	774	610
Canada 2	14,856	15,531	4,932	4,506	5,513	5,894	442	558	3,969	4,413
Mexico	62	54	-	-	-	-	-	-	62	54
<b>Destinations Not Revealed</b>	994	1,211	487	308	160	312	49	80	898	511
<b>Destinations and/or Consumer Uses Not Available</b>										
Great Lakes movement:										
Canadian commercial docks	508	468	-	-	-	-	-	-	-	-
Vessel fuel	878	1,054	-	-	-	-	-	-	-	-
U.S. dock storage	-62	-6	-	-	-	-	-	-	-	-
Tide-water movement:										
Overseas exports (except Canada)	24,174	23,287	-	-	-	-	-	-	-	-
Rubber fuel	5	13	-	-	-	-	-	-	-	-
U.S. dock storage	-	-	-	-	-	-	-	-	-	-
Railroad fuel, total	1,179	1,308	-	-	-	-	-	-	-	-
All methods of movement:										
United States companies	1,146	1,366	-	-	-	-	-	-	-	-
Canadian companies	35	42	-	-	-	-	-	-	-	-
Coal used at mines and sales to employees	1,078	2,098	-	-	-	-	-	-	-	-
Net change in mine inventory	665	891	-	-	-	-	-	-	-	-

FOOTNOTES

(Where special combinations of consumer uses, methods of movement, States of destination, etc., are shown in footnotes, it is for purposes of concealment of individual respondent figures.)

- 1/ Includes vessel fuel and bunker fuel, the destinations of which are not available.
- 2/ Excludes shipments to Canadian Great Lakes commercial docks and United States dock storage for which consumer uses are not available; however, includes vessel fuel, the destinations of which are not available.
- 3/ Excludes overseas exports and United States tidewater dock storage for which consumer uses are not available; however, includes bunker fuel, the destinations of which are not available.
- 4/ A considerable block of tonnage is included under "Destinations Not Available."
- 5/ Excludes shipments to Canadian Great Lakes commercial docks and Canadian railroad companies.

89TH CONGRESS }  
2d Session }

SENATE

DOCUMENT  
No. 78*Crisswell b-p Ex 3 -  
8/17/67***AIR POLLUTION BY  
FEDERAL FACILITIES****REPORT**

OF THE

**SECRETARY OF HEALTH, EDUCATION,  
AND WELFARE**

TO THE

**CONGRESS OF THE UNITED STATES**

IN COMPLIANCE WITH

PUBLIC LAW 90-148

**THE CLEAN AIR ACT, AS AMENDED****JANUARY 1968****APRIL 1, 1968.—Ordered to be printed****U.S. GOVERNMENT PRINTING OFFICE  
WASHINGTON : 1968**

## SENATE RESOLUTION 261

Submitted by Mr. Randolph of West Virginia

IN THE SENATE OF THE UNITED STATES.

*Agreed to April 1, 1968.*

*Resolved*, That there be printed as a Senate document the report of the Secretary of Health, Education, and Welfare, entitled "Air Pollution by Federal Facilities", in compliance with the provisions of title I, section 111(b) of the Clean Air Act, Public Law 90-148, as amended; and that there be printed 2,500 additional copies of such document for the use of the Committee on Public Works.

Attest:

FRANCIS R. VALEO,  
*Secretary.*

By DARRELL ST. CLAIRE,  
*Chief Clerk.*

## LETTER OF TRANSMITTAL

THE SECRETARY OF HEALTH, EDUCATION, AND WELFARE,  
Washington, D.C., February 7, 1968.

HON. HUBERT H. HUMPHREY,  
President, U.S. Senate,  
Washington, D.C.

DEAR MR. PRESIDENT: In accordance with the provisions of title I, section 111(b) of the Clean Air Act, Public Law 90-148, as amended, there is transmitted herewith a report on measures being taken to control the emission of air pollutants from Federal facilities.

Sincerely,

WILBUR J. COHEN,  
Acting Secretary.

(11)



## AIR POLLUTION BY FEDERAL FACILITIES

### INTRODUCTION

The Clean Air Act, as amended, emphasizes the need for Federal leadership and assistance to State and local agencies in the control of air pollution. In addition, the act indicates that the Federal agencies shall cooperate with the Department of Health, Education, and Welfare and with any air pollution control agency in preventing and controlling air pollution from the facilities for which they are responsible. It also provides for the establishment of classes of air pollution sources for which limited permits could be issued and further requires the Secretary to submit an annual report to the Congress on the status of such permits and compliance therewith. The language of the act is such that the Secretary is given discretion with respect to the classification and permit procedure to be established.

In addition to the act mentioned above, the program of abatement and control of air pollution from Federal facilities is governed by Executive Order 11282, dated May 26, 1966, entitled "Control of Pollution Originating from Federal Installations," by the "Performance Standards and Techniques of Measurement" prescribed by the Secretary of Department of Health, Education, and Welfare, issued June 2, 1966, in response to "Sec. 5 Standards" of Executive Order 11282 and by Bureau of the Budget Circular No. A-78 issued on August 6, 1966, and sent to the heads of executive departments and establishments.

It is expected that several years effort will be required to fully control air pollutant emissions from Federal establishments in accordance with the best current practices. To provide the necessary technical guidance for this overall effort, the National Center for Air Pollution Control of this Department has established a Federal Facilities Section, the staff of which will devote full time to the surveillance of air pollution problems arising from Federal activities, the extension of technical assistance to other agencies and departments, and to studies of the scheduling of the necessary improvements in control of the emissions at Federal establishments.

### ACCOMPLISHMENTS

The Performance Standards accompanying Executive Order 11282, through section 76.5(c)(1), called for the Secretary of the Department of Health, Education, and Welfare to establish by regulation limits on the emission of sulfur oxides to the atmosphere from Federal facilities within 6 months of the effective date of the standards for standard metropolitan statistical areas or standard consolidated areas which have a population exceeding 2 million and a population density exceeding 15,000 persons per square mile. The result of this require-

ment, which pertains only to the New York, Chicago, and Philadelphia metropolitan areas, was the preparation and publication in the November 22, 1966, issue of the Federal Register of a notice of intention to adopt—30 days after the publication of the notice—specific limits on the emission of sulfur oxides in these three areas. The 30-day effective time limit was extended by the Secretary of the Department of Health, Education, and Welfare for an additional 90 days at the request of an industrial trade association which was concerned about the impact of the proposed regulations on certain segments of the fossil fuel industry. The proposed limits were published in final form in the March 23, 1967, issue of the Federal Register to be effective October 1, 1968.

The limitations on sulfur oxide emissions for Federal facilities in these three heavily polluted areas are sufficiently stringent to cause serious concern and attention. Information received indicates that all agencies intend to comply with the regulations as rapidly as possible. This compliance is related closely to the efforts of the air pollution control agencies in these cities to relieve their population of excessively high exposure to sulfur oxides and is an excellent example of cooperation by Federal agencies with local authorities.

During 1967, a number of studies of special Federal problems of air pollution and its control have been undertaken. Both the General Services Administration and the Department of Defense began studies of problems associated with fuel supply nationally and with specific emphasis on New York, Philadelphia, and Chicago. The Department of Defense initiated a program of testing fuel oil for its sulfur content since the current military and Federal specifications on fuel oil permit sulfur contents which are considerably in excess of that associated with current and anticipated limits. Several directives were issued to military commands to put this new program into effect immediately. Laboratory resources of the Department of Defense will be utilized for this program.

Toxic rocket propellants continued to be a problem during 1967. Potential beryllium emissions have been controlled, largely because of the Public Health Service policy statement on beryllium issued in 1966, and through the excellent cooperation by the two principal agencies concerned (DOD and National Aeronautics and Space Administration).

Interagency leadership resulted in preventing potential widespread atmospheric pollution with toxic chemicals under development for use in Federal missile and aerospace activities. Both the Department of Defense and the National Aeronautics and Space Administration took appropriate actions to insure compliance with recommended guidelines issued with the Public Health Service policy statement on beryllium.

The policy, based on recommendations of the National Academy of Science's Committee on Toxicology, maintains that, with present scientific information, prudence requires the assumption that all compounds of beryllium possess long-range toxicity for some humans. Therefore, no amount of beryllium should be deliberately emitted to the atmosphere, except under circumstances directly relevant to defense of the Nation.

New justification for the longstanding Federal concern about contamination of the ambient atmosphere, by even minute amounts of

## AIR POLLUTION BY 3 FEDERAL FACILITIES

beryllium arising from any activity of government, was provided by a recent court decision. In October 1967 a Pennsylvania jury awarded \$109,120 to a 45-year-old mother on the ground that her serious lung disease was caused by beryllium fumes emitted to the atmosphere by an industrial plant located several miles from her residence. (*Heck v. Beryllium Corp.*, Berks County, Pennsylvania Court of Common Pleas.)

Although that court decision produced no change in the conservative Public Health Service policy toward control of beryllium, it did stimulate intensified activity within the Department of Defense to assure enforcement of the stringent guidelines issued earlier to control any rocket motor tests required by the national defense. It also stimulated serious reappraisal of the need for toxic rocket propellants, and this reappraisal was going on at year's end, when virtually all research and development involving beryllium as a propellant had stopped.

Activity also was continued in Chattanooga and Hamilton County, Tenn., because of continued interest of citizens of the area in general air pollution abatement, because of complaints concerning the emissions from the Volunteer Army Ammunition Plant in Hamilton County and because of technical problems involving efforts to control sulfur oxides, nitric oxides, sulfuric and nitric acid mists, red water incinerator wastes and other contaminants. The Abatement Program is studying the air pollution situation of the entire area and air pollution from the ammunition plant. The most significant recommendation made to the Office of the Surgeon General, Department of the Army, by the Public Health Service was to install catalytic reduction units at the plant to reduce markedly the emissions of nitric oxides to the atmosphere from the nitric acid plants at the Volunteer Army Ammunition Plant.

Special cooperation continues with the Tennessee Valley Authority through its Division of Health and Safety. In addition to participating in an advance review of TVA's phased and orderly plan prior to its submission to the Bureau of the Budget, the Federal Facilities Section and meteorological personnel of the abatement program also reviewed TVA's current plans to control air pollution from its new plant in Cumberland City, Tenn. This plant will burn a high-sulfur coal which is the most readily available fuel in the quantities needed and will have one or two 1,000 foot stacks equipped with highly efficient (99 percent) electrostatic precipitators to control particulate emissions, depending on final engineering design decisions. Although there is not considered to be a currently acceptable economic method of removing sulfur oxides from these stack gases, TVA recognizes that these oxides may be a problem and has provided for installation of control mechanisms in the future when they are developed. It should be noted here that considerable research is underway by the Public Health Service and TVA, by the Bureau of Mines of the Department of the Interior and by private utilities and chemical companies to develop technology to remove sulfur oxides from stack gases of powerplants.

Most of the activity by the Federal Facilities Section of the abatement program involved assistance to the departments and agencies in preparing their 5-year phased and orderly plan for the Bureau of

the Budget and, during the second half of 1967, in analyzing these phased and orderly plans for the Bureau of the Budget. Fourteen departments and agencies prepared and submitted their plans for air pollution control improvements to the Bureau of the Budget by July 1, 1967; the Post Office Department plan was received December 26, 1967.

The agencies estimated a cost of approximately \$18 million for air pollution abatement work scheduled for fiscal year 1968. In fiscal year 1969, the projects included in the approved plan are estimated to cost approximately \$31 million.

The air pollution phased and orderly plan for the initial 14 departments and agencies submitting data to the Bureau of the Budget as called for by Executive Order 11282 covers proposed corrective actions for fiscal years 1969 through 1973 affecting approximately 435 projects.

The plan by agency breaks down as follows:

	Projects
Department of Defense.....	349
Veterans' Administration.....	26
Atomic Energy Commission.....	13
Tennessee Valley Authority.....	5
All other agencies.....	42
Total (all agencies).....	435

The projects represent Federal facilities in 49 of the States, the District of Columbia and the Commonwealth of Puerto Rico. No projects were submitted from Delaware, the Virgin Islands, American Samoa or Guam. All of the projects are specifically concerned with abatement of air pollution. Some place in this plan are examples of all of the usual types of air pollution problems found among non-Federal activities across the country as well as unique problems associated with the production of munitions and hardware associated with our national defense. The details of these projects form the basis for a national inventory of Federal air pollution sources and needed corrective measures.

Projects were reported to the Bureau of the Budget on forms designed by that Bureau and these were reviewed by the Federal Facilities Section for the Bureau. In some cases, as necessary, further consultation was held with the departments or agencies concerned and minor amendments and corrections were made. In many cases, the cost estimates are based upon preliminary engineering and economic judgments and, before final decisions are made, may be modified to reflect new choices for corrective measures. For example, where lower sulfur fuels are necessary, final decisions concerning the use of coal, oil or natural gas will depend upon the economic picture at the time of purchase and upon the ready availability of an appropriate low-sulfur fuel at the site. Generally speaking, from an engineering and cost point of view, the plans presented acceptable proposals for abatement of air pollution and the Bureau of the Budget was so notified.

As might be expected, the agencies' proposals were directed principally at the reduction of sulfur oxide emissions, reduction of particulates by installation of high-efficiency separators and provision of improved methods of solid waste disposal through incineration or sanitary land-fill operations. Compliance with the strict sulfur oxide regulations governing facilities in New York, Philadelphia, and Chicago is receiving careful attention. Areas in the country where there

exists the actuality or probability of interstate air pollution also had high priority in these plans. Provision of flue gas scrubbers, smoke detectors, and alarms, submerged inlets for certain fuel storage units, installation of special incinerators for disposal of biological wastes, high-efficiency cyclones, absorption towers, mist eliminators, catalytic reduction units, waste shredders and wood hammer mills, are examples of other abatement devices needed for the projects.

At the request of the Bureau of the Budget, the Federal Facilities Section analyzed the 1969 portion of the 5-year phased and orderly plan and suggested to the Bureau a system of priorities through which the projects could be classified by financial quartiles. In establishing these priorities, consideration was given items such as complaints, violation of local air pollution codes, degree of seriousness of potential health hazard, location of the facility with special emphasis on interstate areas and interstate areas in which the Department of Health, Education, and Welfare had initiated formal abatement actions under the Clean Air Act of 1963, as amended. Attention also was called to projects on which abatement work has been started or scheduled in 1968 out of regularly appropriated funds of each agency.

The Federal Facilities Section, abatement program, was notified that the Bureau of the Budget approved for financing in 1969 all projects for facilities located in the New York City, Chicago, and Philadelphia metropolitan statistical areas, the Washington, D.C. metropolitan area, all projects where violation of local air pollution control regulations exist, where significant potential health hazards exist and all projects located in interstate areas where the Department of Health, Education, and Welfare has started air pollution abatement proceedings under the Clean Air Act of 1963, as amended. A list of these projects received from the Bureau of the Budget, by agency and location, is found in appendix A.

The data submitted by the agencies in most cases included abatement projects on which work had been started or scheduled in 1968 fiscal year. Many of these projects are to be completed during that year but others require additional support in subsequent fiscal years. (A list of the projects scheduled to start in 1968 is found in app. B.) These corrective measures scheduled for 1968 cover 166 projects to be financed from regularly appropriated construction, operations, and repair or other moneys and represent a sizable contribution to air pollution control efforts by the Federal agencies. The projects scheduled for completion during 1968 for the most part solve relatively simple problems such as conversion to similar but lower sulfur fuels, installation of smoke detectors or provision of sanitary land-fills as a substitute for open burning of solid wastes. The Veterans' Administration and TVA are outstanding with respect to these planned projects as part of their regular operations, repair and maintenance activities. The Department of Defense also had an appreciable input.

Progress with respect to the abatement projects which are funded for fiscal year 1969 can be followed through the annual reports called for from each participating agency by Executive Order 11282 and Bureau of the Budget Circular No. A-78. The first of these reports is due on July 1, 1968 at the Bureau of the Budget.

Several agencies have problems of open burning of solid wastes which, although not reported in the phased and orderly plan, are

being studied by the agencies in cooperation with the Federal Facilities Section of the National Center for Air Pollution Control and the solid wastes program of the National Center for Urban and Industrial Health of the Department of Health, Education, and Welfare. The results may indicate needs for further proposals for air pollution abatement as an extension of the plan in fiscal years 1969 or 1970.

The adoption of regulations for the control of organic solvents such as rule 66 of the Los Angeles County Air Pollution Control District and rule 3 of the San Francisco Bay Area Air Pollution Control District during 1967 also brings a need for several agencies to assess this problem as soon as possible. The Department of Defense already is active in this respect and all other agencies have been notified to review their operations in the Los Angeles and the San Francisco areas. There appears to be a need for uniformity with respect to these rules to prevent the adoption of different requirements in many different sections of the country. The National Center for Air Pollution Control currently is establishing an Advisory Committee on Organic Solvents to consider this matter further.

During December 1967, the Department of Health, Education, and Welfare called a conference under procedures of the Clean Air Act of 1963, as amended, to consider problems associated with interstate air pollution in the Washington, D.C., metropolitan area. As part of that conference each Federal agency presented its plans to abate air pollution from its facilities in the defined area. Federal installations account for about 30 percent of the air pollution of the District of Columbia and about 10 percent of the metropolitan area total. It is estimated that approximately \$2 million will be required to abate air pollution from Federal operations in the area considered by the conference, exclusive of the \$733,333 grant made by the Department of Health, Education, and Welfare to the government of the District of Columbia to permit the development of a sanitary landfill and the abolishment of open burning at the Kenilworth dump. Technology is available to solve the other major air pollution problems in the area. The General Services Administration is expected to play a key part in Washington, as elsewhere, because of its role in purchasing low-sulfur fuels for both the Federal Government buildings and those of the District of Columbia. The presentation of the Federal agency plans was important to this conference because of the relatively high density of Federal activities in the District of Columbia area.

No requests have been received from any department or agency for exemption from the provisions of the standards accompanying Executive Order 11282, and no requests have been received for operating permits. The cooperation by the Federal agencies with the Department of Health, Education, and Welfare and the Bureau of the Budget in developing the 5-year phased and orderly plan is overwhelming evidence of their desire to fully participate in developing national leadership in air pollution abatement envisioned by the Executive order. Eventual realization of this objective will depend upon the rate at which the program is funded.



## APPENDIXES

## APPENDIX A

1969 PROJECTS TO BE FUNDED (BASED UPON DATA RECEIVED FROM DOD DEC. 28, 1967)

Agency	Location	Problems
<b>Department of Defense:</b>		
Air Force	Andrews Air Force Base, Camp Springs, Md.	Fuel conversion, incinerator, smoke detectors.
	Davis-Monthan Air Force Base, Tucson, Ariz.	Smelting of scrap metal.
Army	Cameron Station, Alexandria, Va.	Vapor control, incinerator replacement.
	Volunteer Army Ammunition Plant, Chattanooga, Tenn.	H <sub>2</sub> O, SO <sub>2</sub> , H <sub>2</sub> SO <sub>4</sub> , particulates, incinerator.
	Arlington Hall Station, Arlington, Va.	Incinerator.
	Fort George Meade, Odenton, Md.	Fuel conversion, vapor control.
	Frankford Arsenal, Philadelphia, Pa.	Fuel conversion.
	Picatinny Arsenal, Dover, N.J.	Electrostatic precipitators, flue gas scrubbers, fuel conversion, incinerators.
	Fort Hamilton, Brooklyn, N.Y.	Vapor control, scrubbers, etc.
	Fort Dix, Fort Dix, N.J.	Mechanical collectors.
	Sunflower Army Ammunition Plant, Johnson Co., Kans.	Incinerators absorption tower, fly ash collectors.
	Joliet Army Ammunition Plant, Joliet, Ill.	Fuel conversion, mist eliminators, catalytic reduction, incinerators, particulate collectors.
	Pentagon, Washington, D.C.	Vapor control.
	Bader Army Ammunition Plant, Bsraboo Wis.	Electrostatic precipitators, fuel conversion vapor control.
	Naval Public Works Center, Great Lakes, Ill.	Fuel conversion.
	Naval Supply Depot, Philadelphia, Pa.	Do.
Navy	Naval Damage Control Training Center, Philadelphia, Pa.	Firefighter school.
	Naval Training Center, Great Lakes, Ill.	Fuel conversion, fire training school.
	Naval Shipyard, Philadelphia, Pa.	Fuel conversion, incinerator, foundry fume collector.
	Electronic Training Center, Naval Station, San Diego, Calif.	Fire training school.
	Naval Air Station, Barber's Point, Honolulu, Hawaii.	Sanitary landfill, firefighter school.
	Naval Research Laboratory, Washington, D.C.	Smoke detectors.
	Naval Air Station, Glenview, Ill.	Firefighter school, smoke detectors.
	U.S. Naval Ordnance Lab, White Oak, Md.	Smoke detectors.
	San Francisco Bay Naval Shipyard, Vallejo, Calif.	Fuel conversion.
	Naval Training Station, San Diego, Calif.	Firefighting school.
	Naval Air Station, Alameda, Calif.	Vapor recovery; firefighter school; scrubber; afterburner.
	Naval Air Station, Moffett Field, Sunnyvale, Calif.	Vapor control; sanitary landfill.
	Marine Corps Supply Center, San Bernardino, Calif.	Incinerator.
	Marine Corps Base, 29 Palms, San Bernardino, Calif.	Landfill.
	Naval Supply Center, Norfolk, Va.	Vapor control; fume collectors on smelters; rebuild furnaces.
	Naval Air Station, San Diego, Calif.	Fire school; vapor control, plating plant control.
	San Francisco Bay Naval Shipyard, San Francisco, Calif.	Fuel conversion.
	Naval Fuel Depot, San Pedro, Calif.	Vapor control.
	Naval Station, Long Beach, Calif.	Incinerator.
	Fleet Training Center, Newport, R.I.	Fire training center.
	Naval Public Works Center, Norfolk, Va.	Fuel conversion alarms and detectors.
	Navy Public Works Center, Newport, R.I.	Incinerator, fly ash eliminators.
	U.S. Naval Air Station, Minneapolis, Minn.	Vapor control; firefighter school; smoke detector.
Navy	Naval Air Depot, Hawthorne, Nev.	Smoke recorders; fume collectors, fire school; baghouses.
	Marine Corps Station, San Diego, Calif.	Smoke detector.
	Naval Station, Kodiak, Alaska.	Sanitary landfill; fire school; smoke detectors.

Agency	Location	Problem
Department of Defense—Con. Navy—Con.	Puget Sound Naval Shipyard, Bremerton, Wash. Naval Torpedo Station, Rayport, Wash. Naval Station, Adak, Alaska.	Paint and metal fumes; smoke detectors; shredder and pulper. Painting fumes; landfill; shredder-pulper. Sanitary landfill, incinerator, fire school. Dust removal.
Corps of Engineers (Civil Works)	San Francisco Harbor Potomac and Annapolis Rivers, Washington, D.C.	Dust removal.
Department of Commerce	None	None
Department of Justice	Do.	Do.
Department of Interior	Do.	Do.
General Services Administration	Do.	Do.
Treasury Department	Do.	Do.
Atomic Energy Commission	Brockhaven National Laboratory, Brookhaven, N.Y. Argonne National Laboratories, Argonne, Ill. Burdick Plant, Kansas City, Mo. PDS Hospital, Detroit, Mich. Gallatin College, Washington, D.C. Agricultural Research Center, Beltsville, Md. Area No. 3, Animal husbandry, meat labs. Animal Parasite Station. National Zoological Park, Washington, D.C.	Fuel conversion. Do. Incinerator and waste destructor. Incinerators and boilers. Incinerators. Fuel conversion, incinerator. Incinerator. Do.
Department of Health, Education, and Welfare	VA Hospital, East Orange, N.J. VA Hospital, San Francisco, Calif. NASA Industrial Plant, Downey, Calif. Missouri Assembly Facility, New Orleans, La.	Replace boilers. Incinerator, new and replacement. Incinerator for solvent control. Incinerator.
Department of Agriculture	Mississippi Test Facility, Bay St. Louis, Miss.	Incinerator or sanitary landfill.
Smithsonian Institution	None	None
Veterans' Administration	VA Hospital, East Orange, N.J. VA Hospital, San Francisco, Calif. NASA Industrial Plant, Downey, Calif. Missouri Assembly Facility, New Orleans, La.	Replace boilers. Incinerator, new and replacement. Incinerator for solvent control. Incinerator.
National Aeronautics and Space Administration	Mississippi Test Facility, Bay St. Louis, Miss.	Incinerator or sanitary landfill.
Post Office Department	Plan arrived late (Dec. 28, 1967), projects not reviewed by HCAP.	None
Tennessee Valley Authority	Shawnee Steam Plant, McCrackan Co., Ky. Gallatin Steam Plant, Gallatin, Tenn. Calbert Steam Plant. Widow Creek Steam Plant. Power Building, Chattanooga, Tenn.	Installation of electrostatic precipitators. Electrostatic precipitators. Electrostatic precipitators and mechanical collectors. Do. Install dust collector in change hall.

## APPENDIX B

## 1968 PROJECTS SUBMITTED BY PARTICIPATING DEPARTMENTS AND AGENCIES

Agency	Location	Problem
Department of Defense: Air Force	Williams Air Force Base, Chandler, Ariz. Beale Air Force Base, Marysville, Calif. Cape Kennedy, Cape Canaveral, Fla. Eglin Air Force Base, Walton Beach, Fla. Patrick Air Force Base, Cocoa Beach, Fla. Robins Air Force Base, Warner Robins, Ga. Scott Air Force Base, Belleville, Ill. Chamblee Air Force Base, Ramoth, Ill. Bomber Hill Air Force Base, Peru, Ind. Phelps Collins AHS Base, Alpena County, Mich. Offutt Air Force Base, Omaha, Neb. Omaha Air Force Station, Omaha, Neb. Lockport Air Force Station, Lockport, N.Y. Hill Air Force Base, Ogden, Utah. F. E. Warren Air Force Base, Cheyenne, Wyo. Wright-Patterson Air Force Base, Greene County, Ohio. Sillville Air Force Base, Mount Clemens, Mich.	Vapor control. Scrubber for incinerator. Incinerator modifications, firefighting school. Install incinerator; vapor control; catalytic combustion chamber. Provide incinerator. Incinerator and furnace installation. Sanitary landfill, modify heating plant. Install 2 incinerators. Install incinerator, electrostatic precipitators. Vapor control. Modify incinerator, new incinerator. Fuel conversion. Mechanical filters. Fuel conversion, modify incinerator, wood hammer mill. Fuel conversion or electrostatic precipitators. New incinerator with new control equipment. New incinerator, modify heating plant.

Agency	Location	Problem
Department of Defense—Con. Air Force—Con.	Wurtsmith Air Force Base, Oscoda, Mich.	Electrostatic precipitators.
	Vandenberg Air Force Base, Santa Barbara County, Calif.	Installation of vapor recovery system.
	Tyndall Air Force Base, Panama City, Fla.	Landfill.
	Hickam Air Force Base, Honolulu, Hawaii.	Modify incinerators; install pressure and vacuum relief valves.
	Barksdale Air Force Base, Bossier City, La.	New incinerator and waste disintegrators.
	L. G. Hanscom Field, Bedford, Mass.	Install smoke detectors.
	McGuire Air Force Base, Burlington County, N.J.	Fuel conversion.
	Manassas Air Force Station, Manassas, Va.	Do.
	National Guard Air Base, Floyd Bennett Field, Kings County, N.Y.	Do.
	Minot Air Force Station, Minot, N. Dak.	Do.
	Greaser Pittsburgh Airport, ARPT, Allegheny County, Pa.	Install fill extension pipes.
	Laughlin Air Force Base, San Antonio, Tex.	Install shredder.
	Perrin Air Force Base, Sherman, Tex.	Install incinerator.
	St. Albans Air Force Station, St. Albans, Vt.	Electrostatic precipitators.
	Minneapolis-St. Paul International Airport, Minneapolis, Minn.	Fuel conversion.
	Blaine Air Force Station, Blaine, Wash.	Install dust collectors.
	Lockbourne Air Force Base, Columbus, Ohio.	Fuel conversion.
Army	Kingsley Field, Klamath Falls, Oreg.	Modify tank filling equipment.
	Fort Lewis, Tacoma, Wash.	Fuel conversion, vapor control, smoke detector.
	Fort Knox, Fort Knox, Ky.	Fuel conversion, high efficiency separators.
	Camp Pickett, Blacksburg, Va.	Fuel conversion, vapor control.
	USAMRIID Center and Fort Lee, Fort Lee, Va.	Do.
	Volunteer Army Ammunition Plant, Chattanooga, Tenn.	Multiple emissions.
	Tobyhanna Army Depot, Tobyhanna, Pa.	Smoke detector, vapor control.
	Waterford Arsenal, Waterford, N.Y.	Modify incinerator, smoke detector, contract waste disposal.
	Fort Dix, Fort Dix, N.J.	Fuel conversion, mechanical collectors.
	Fort Leonard Wood, Waynesville, Mo.	Fuel conversion, vapor control.
	Corshusker Army Ammunition Plant, Grand Island, Neb.	New incinerator, fuel conversion.
	Fort Benjamin Harrison, Indianapolis, Ind.	Fuel conversion, smoke alarm.
	Sierra Army Depot, Hering, Calif.	Fuel conversion.
	D. A. Rocky Mountain Arsenal, Denver, Colo.	Vapor control, incinerator control.
Navy	Navy Public Works Center, Great Lakes, Ill.	Fuel conversion.
	Naval Training Center, Great Lakes, Ill.	Fuel conversion, freighter school.
	Naval Shipyard, Philadelphia, Pa.	Incinerator, fuel conversion, fume collector.
	Naval Supply Depot, Philadelphia, Pa.	Fuel conversion.
	Fleet Training Center, San Diego, Calif.	Freighter school.
	Fleet Training Center, Newport, R.I.	Freighter training school.
	Public Works Center, Newport, R.I.	Incinerator, fume control.
	Naval Shipyard, Boston, Mass.	Incinerator, dust collectors.
	Naval Air Station, Honolulu, Hawaii.	Sanitary landfill, freighter school.
	Naval Shipyard, Charleston, S.C.	Dust collector, fume collector.
	Naval Training Center, Balisbridge, Md.	Precipitators and incinerators, scrubbers.
	Electrical Training Center, Norfolk, Va.	Firefighting school.
	Naval Air Station, Brooklyn, N.Y.	Fuel conversion.
	Naval Hospital, Queens County, N.Y.	Fuel conversion, scrubbers on incinerators.
	Marine Corps Supply Activity, Philadelphia, Pa.	Fuel conversion.
	Naval Hospital, Philadelphia, Pa.	Do.
	Naval Air Engineering Center, Philadelphia, Pa.	Do.
	Naval Air Development Center, Philadelphia, Pa.	Do.
	Naval Ammunition Depot, Monmouth County, N.J.	Do.
	Mitchell House Federal Housing (part of city), Garden City, N.Y.	Do.
	1st Marine Corps District, New York, N.Y.	Do.
	Naval Reserve Training Center, Clifton, N.J.	Do.

Agency	Location	Problem
Department of Defense—Cm. Navy—Cm.	Naval Reserve Training Center, Elizabeth, N.J.	Fuel conversion.
	Naval Reserve Training Center, Nassau County, N.Y.	Do.
	Naval Reserve Training Center, Suffolk County, N.Y.	Do.
	Naval Reserve Training Center, Jersey City, N.J.	Do.
	I.R.D. Reserve Shipyard, Newark, N.J.	Do.
	Naval Reserve Training Center, Wallington, N.Y.	Do.
	Naval and Marine Corps Training Center, Schuyler, N.Y.	Do.
	Naval Reserve Training Center, Youngstown, N.Y.	Do.
	Marine Corps Reserve Training Center, New York, N.Y.	Do.
	Naval Shipyard, Kings County, N.Y.	Install scrubber on incinerator.
	None	None.
U.S. Department of Agriculture	Do.	Do.
Department of Interior	Do.	Do.
Smithsonian	Argonne National Laboratory, Argonne, Ill.	Fuel conversion.
Atomic Energy Commission	Brookhaven National Laboratory, Brookhaven, N.Y.	Do.
	Mount Laboratory, Miamisburg, Ohio	Fuel conversion incinerator w/scrubber.
	Burlington Plant, Burlington, Iowa	Fuel conversion.
	Knoles Atomic Power Laboratory, West Milton, N.Y.	Install smoke detectors, fuel conversion.
	Knoles Atomic Power Laboratory, Rickmansworth, N.Y.	Install submerged filling inlet.
	Oak Ridge National Laboratory, Oak Ridge, Tenn.	Install vapor recovery and control systems.
	Argonne National Laboratory, Bingham County, Idaho	Install alarm system.
	Savannah River Plant, Aiken and Barnwell Counties, S.C.	Sanitary landfill.
	Richland Operations Office Adams, Borton, Grant, and Franklin Counties, Wash.	Install monitoring and recording instruments.
	Knoles Atomic Power Laboratory, Bingham County, Idaho	Install smoke detector, increase stack height, install fuel air controls.
	Puget Sound	Drift removal.
Corps of Engineers (Civil Works)	New York Harbor	Do.
	Derrickboat Towavanda, Cleveland, Ohio	Conversion to No. 2 oil.
National Aeronautics and Space Administration	U.S. clipper dredge Rensselaer, various harbors on Lake Michigan	Install smoke detector.
	Michoud Assembly Facility, Marshall Space Flight Center, New Orleans, La.	Fuel conversion, incinerator.
	Goddard Space Flight Center, Greenbelt, Md.	Fuel conversion.
	Ames Research Center, Moffett Field, Calif.	Fume scrubber, incinerator after-burner.
	Langley Research Center, Hampton Va.	To study control requirements of heating plant.
	Federal Bureaus of Investigation, Petersburg, Va.	Fuel conversion.
	National Bureau of Standards, Gaithersburg, Md.	Do.
	Federal Office Building, Brooklyn, N.Y.	Do.
	U.S. Courthouse and Federal Building, Chicago, Ill.	Do.
	Hunting plant, Philadelphia, Pa.	Do.
	Bronx Central Station, Bronx, N.Y.	Do.
General Services Administration	Federal Office Building, New York, N.Y.	Do.
	Courthouse and Federal Building, Brooklyn, N.Y.	Do.
	Post Office and Courthouse, Newark, N.J.	Do.
	Somerville Duput, Somerville, N.J.	Do.
	Federal Office Building, Brooklyn, N.Y.	Do.
	Madison Square Post Office, New York, N.Y.	Do.
	Post Office and Courthouse, Camden, N.J.	Do.
	Post Office, Jersey City, N.J.	Do.
	North Philadelphia Postal Station, Philadelphia, Pa.	Do.
	Federal Building, Newark, N.J.	Do.
	Post Office, Paterson, N.J.	Do.
	Federal Building and U.S. Courthouse, Hammond, Ind.	Do.
	Post Office, Flushing, N.Y.	Do.
	Post Office, Jamaica, N.Y.	Do.
	U.S. Post Office, Oak Park, Ill.	Do.

Agency	Location	Problem
General Services Administration—Con.	Post Office, East Orange, N.J.	Fuel conversion.
	U.S. Post Office, Maryland, Md.	Do.
	U.S. Post Office, Waukegan, Ill.	Do.
	Post Office, Long Island, N.Y.	Do.
	Englewood Postal Station, Chicago, Ill.	Do.
	Post Office Elmhurst, Ill.	Do.
	Federal Center Building 47, Denver, Colo.	Do.
Tennessee Valley Authority	Post Office, Minneapolis, Minn.	Repair heating plant and fuel conversion.
	Shawnee Steam Plant, Tenn.	Particulates.
	Celbert Steam Plant, Tenn.	Do.
	Widow's Creek Steam Plant, Tennessee	Do.
	Callahan Steam Plant, Tennessee	Do.
Department of Health, Education, and Welfare	Power Building, Chattanooga, Tenn.	Install dust collector or fuel conversion.
	PHS Hospital, Fort Worth, Tex.	Incinerator, combustion controls.
	PHS Hospital, Lexington, Ky.	Fuel conversion, incinerator.
	PHS Hospital, Boston, Mass.	Incinerator.
	Howard University, Washington, D.C.	Boiler replacement truck for trash removal.
Veterans' Administration	FDA Research Facility, Beltsville, Md.	Incinerator.
	VA Hospital, Ann Arbor, Mich.	Fuel conversion.
	VA Hospital, Battle Creek, Mich.	Do.
	VA Hospital, Castle Point, N.Y.	Provision of landfill.
	Veterans Center, Dublin, Ga.	Fuel conversion and incinerator.
	VA Hospital, Durham County, N.C.	Fuel conversion.
	VA Hospital, Erie, Pa.	Do.
	VA Center, Fargo, N. Dak.	Do.
	VA Hospital, Fayetteville, N.C.	Do.
	VA Hospital, Grand Junction, Colo.	Do.
	VA Hospital, Iron Mountain, Mich.	Do.
	VA Hospital—Jefferson Barracks, St. Louis, Mo.	Do.
	VA Hospital, Kansas City, Mo.	Do.
	VA Hospital, Knoxville, Tenn.	Do.
	VA Hospital, Lexington, Ky.	Do.
	VA Hospital, Louisville, Ky.	Do.
	VA Hospital, Lyons, N.J.	Do.
	VA Hospital, Madison, Wis.	Do.
	VA Hospital, Montrose, N.Y.	Fuel conversion, new incinerator.
	VA Hospital, Sheridan, Wyo.	Fuel conversion.
	VA Hospital, Spokane, Wash.	Do.
	VA Hospital, Toms, Wis.	Do.
	VA Hospital, Vancouver, Wash.	Do.
	VA Hospital, West Haven, Conn.	Do.
	VA Hospital, Aspinwall, Pa.	Replace boiler.
	VA Hospital, Salem, Va.	Sanitary landfill, replace boilers.
	VA Hospital, Mountain Home, Tenn.	Replace boilers.
	VA Hospital, Chillicothe, Ohio	Replace boiler plant, develop sanitary fill.

91st CONGRESS }  
1st Session

SENATE

{ DOCUMENT  
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8/19/67*

**AIR POLLUTION ABATEMENT BY  
FEDERAL FACILITIES**

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**SECOND REPORT**  
OF THE  
**SECRETARY OF HEALTH, EDUCATION,  
AND WELFARE**  
TO THE  
**UNITED STATES CONGRESS**  
PURSUANT TO  
Public Law 90-148  
**THE AIR QUALITY ACT OF 1967**

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**JANUARY 1969**



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## SENATE RESOLUTION 88

Submitted by Mr. Randolph of West Virginia

IN THE SENATE OF THE UNITED STATES,  
*Agreed to March 4, 1969.*

*Resolved*, That there be printed with illustrations as a Senate document the report of the Secretary of Health, Education, and Welfare, entitled "Air Pollution Abatement by Federal Facilities" submitted to the Congress in accordance with section 306, Public Law 90-148, the Air Quality Act of 1967, and that there be printed two thousand five hundred additional copies of such document for the use of the Committee on Public Works.

FRANCIS R. VALEO,  
*Secretary.*

(11)

## LETTER OF TRANSMITTAL

THE SECRETARY OF HEALTH, EDUCATION, AND WELFARE,  
*Washington, D.C., January 17, 1969.*

HON. HUBERT H. HUMPHREY,  
*President of the Senate,*  
*Washington, D.C.*

DEAR MR. PRESIDENT: In accordance with the provisions of title I, section 111(b) of Public Law 90-148 (the Air Quality Act of 1967), I am pleased to transmit the report on measures being taken by Federal agencies to control the emission of air pollutants from Federal facilities.

It is the intent of this report to describe in detail such progress as has been made toward controlling air pollution from sources for which Federal departments or agencies have jurisdiction.

Sincerely,

WILBUR J. COHEN,  
*Secretary.*

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## AIR POLLUTION ABATEMENT BY FEDERAL FACILITIES

### I. INTRODUCTION

The Air Quality Act of 1967, as did the earlier Clean Air Act, as amended, emphasizes the need for Federal leadership and assistance to State and local agencies in the control of air pollution. The act also indicates that the Federal agencies shall cooperate with the Department of Health, Education, and Welfare and with any air pollution control agency in preventing and controlling air pollution. It also provides, at the discretion of the Secretary, for the establishment of classes of air pollution sources for which limited permits could be issued, and it further requires the Secretary to submit an annual report to the Congress on the status of such permits and compliance therewith.

In addition to this act, the program of abatement and control of air pollution from Federal facilities is governed by Executive Order 11282, dated May 26, 1966, entitled, "Control of Pollution Originating From Federal Installations"; the "Performance Standards and Techniques of Measurement" prescribed by the Secretary of Health, Education, and Welfare, issued June 2, 1966, and subsequently amended, in response to "Section 5 Standards" of Executive Order 11282; Bureau of the Budget Circular No. A-78 issued on August 6, 1966, to the heads of executive departments and establishments.

The issuance of limited exemptions, as provided under the Executive order, has been used as a control device, rather than development of a permit system, as authorized in the Air Quality Act of 1967.

The staff of the Federal Facilities Section, National Air Pollution Control Administration, devotes full time to the surveillance of air pollution problems arising from Federal activities, the extension of technical assistance to agencies and departments and to studies for scheduling necessary improvements to control emissions from Federal establishments. This staff also assists the Bureau of the Budget in technical and administrative review of the 5-year phased and orderly plans prepared by the various governmental groups concerned in this abatement activity.

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## II. ABATEMENT PLAN

As called for by Executive Order 11282 and Bureau of the Budget Circular No. A-78, the departments and agencies submitted revisions of their original phased and orderly plans on July 1, 1968, and also, for the first time, furnished reports of progress on projects which could be funded within available appropriations.

The revised plans are concerned principally with proposed abatement actions to be undertaken during fiscal year 1970. Appendix A contains the detailed proposals for abatement activities which have been recommended for funding by the Bureau of the Budget for fiscal year 1970.

On June 20, 1968, the Secretary of Health, Education, and Welfare announced that 32 Air Quality Control Regions would be designated during the next 12 months. These regions, in the order in which designation is expected to occur, are the following:

- |                     |                          |
|---------------------|--------------------------|
| 1. Washington, D.C. | 17. Hartford             |
| 2. New York         | 18. Indianapolis         |
| 3. Chicago          | 19. Minneapolis-St. Paul |
| 4. Philadelphia     | 20. Milwaukee            |
| 5. Denver           | 21. Providence           |
| 6. Los Angeles      | 22. Seattle-Tacoma       |
| 7. St. Louis        | 23. Louisville           |
| 8. Boston           | 24. Dayton               |
| 9. Cincinnati       | 25. Phoenix              |
| 10. San Francisco   | 26. Houston              |
| 11. Cleveland       | 27. Dallas-Fort Worth    |
| 12. Pittsburgh      | 28. San Antonio          |
| 13. Buffalo         | 29. Birmingham           |
| 14. Kansas City     | 30. Toledo               |
| 15. Detroit         | 31. Steubenville         |
| 16. Baltimore       | 32. Chattanooga          |

Under the Air Quality Act of 1967, designation of regions is a fundamental step leading toward action by State governments to adopt and enforce standards to control air pollution on a regional basis.

Once regions are designated, the Air Quality Act of 1967 requires that States set ambient air quality standards for the regions within 9 months following the publication of criteria for particular pollutants. An additional 6 months are allowed for the development of an implementing plan which would include emission standards for pollution sources. This standard-setting process is expected to begin in the first regions early in calendar year 1969.

Almost all of the Federal facility projects included in the President's budget for fiscal year 1970 are located in the 32 Air Quality Control Regions listed above. The funding of these projects will permit Federal facilities to provide leadership in abating air pollution in these regions.

A few additional projects are included in the President's 1970 budget because they are violations of local codes or are designated to abate toxic emissions which involve imminent danger to health. A project at one installation is included because of excessive complaints from the public.

### III. EXEMPTIONS

The Department of Defense requested and was granted a 1-year exemption (to October 1, 1969) from the provisions of section 70.5, title 42, Code of Federal Regulations, part 76, dated March 17, 1967. This section required control of sulfur oxide emissions in the Chicago and New York Standard Consolidated Areas and the Standard Metropolitan Statistical Area of Philadelphia by October 1, 1968. It was impossible for the Department of Defense to meet this deadline with regard to a number of its facilities which require large capital expenditures for conversion of their boilers. The Department's fiscal year 1969 budget had progressed too far to allow the changes necessary to provide for these conversions. The President's fiscal year 1970 budget will allow the Department to undertake substantially all of these conversions.

The Atomic Energy Commission requested an exemption from the provisions of the same section requiring control of sulfur oxides in the New York and Chicago Standard Consolidated Areas for the Brookhaven and the Argonne National Laboratories, respectively. The request was based on the denial of funds by the Joint Committee on Atomic Energy for conversion to lower sulfur fuels at these laboratories. An exemption for 1 year (to October 1, 1969) has been granted to the Atomic Energy Commission for the Argonne and Brookhaven sites on the proviso that the Commission again request funds for fiscal year 1970 to convert the heating plant at Argonne to natural gas and that efforts be made to secure 1 percent sulfur fuel oil for Brookhaven.

The Joint Committee on Atomic Energy in its denial of funds for fiscal year 1969, urged a delay in the Argonne project pending an expected breakthrough on research which would produce an economically acceptable method of removing sulfur oxides from stack gases. Atomic Energy Commission representatives have been informed by the National Air Pollution Control Administration that the current research on developing control techniques for removing sulfur oxides from stack gases is directed to produce methodology suited for control of large fossil fuel-burning power-generating sources and not directed to heating plants as small as that at Argonne National Laboratory. This laboratory is within the boundaries of the Metropolitan Chicago Interstate Air Quality Control Region, which is identical to the Chicago Standard Consolidated Area. Since the region will be expected to have air pollution control standards and regulations within the next 15 months, a conversion of this facility now would be consistent with providing Federal leadership, as called for in Executive Order 11282.

The Department of Transportation requested, and was granted, a 1-year exemption for fuel conversion at the Coast Guard base on Governor's Island, N.Y. This base is partially converted to burn No. 2 distillate fuel oil, and the exemption was granted with the



proviso that conversion be completed as soon as additional funds become available. It is expected that this task will be completed before October 1, 1969.

Similarly, the Department of Agriculture requested an exemption from the sulfur-oxide regulation for the heating plant at the Plum Island, Long Island, Animal Disease Laboratory. A 1-year exemption also was granted in this case, on the proviso that the laboratory use the lowest possible sulfur content fuel oil which can be obtained from the General Services Administration for use at this site.

#### IV. REMEDIAL ACTIONS

Actions to abate air pollution from Federal facilities were reported this year, for the first time, to the Bureau of the Budget. As required by Bureau of the Budget Circular No. A-78, these reports arrived on July 1, 1968, and reflect conditions as of April 1, 1968.

A summary of these reports reveals that 442 remedial actions were reported for 387 installations located in 45 States, the District of Columbia, Puerto Rico, and Guam. With few exceptions, the remedial actions fall into the following categories:

1. Elimination of open burning of refuse.
2. Installation of new incinerators or upgrading of existing incinerators to meet Federal regulations.
3. Reduction of particulate emissions from heating and power plants by:
  - a. Repairs to old plants.
  - b. Construction of new plants.
  - c. Improvement of particulate collectors.
  - d. Installation or improvement of particulate monitors.
  - e. Conversion from coal to either gas or fuel oil.
4. Reduction of sulfur oxide emissions from heating plants by:
  - a. Using same type of fuel but of lower sulfur content.
  - b. Converting to a different fuel of lower sulfur content.
5. Reduction of gasoline and solvent vapor losses from storage tanks.
6. Awarding of contracts during the year to remedy specific situations.
7. Initiation of studies, design and/or engineering actions to prepare cost estimates.

Appendix B presents an overall summary of accomplishments by agency and by remedial action category.

Appendix C presents a detailed list of installations, arranged by agency, reporting the above listed remedial actions.

These remedial actions reflect, in part, normal air pollution control activities of the agencies funded from their regular budgets as well as actions stimulated and accelerated by the promulgation of Executive Order 11282 and the need to prepare the 5-year phased and orderly plan. Congressional action on fiscal year 1969 budget requests had not been completed by April 1, 1968, and therefore, most of these projects represent relatively small expenditures of funds already available to solve relatively simple and inexpensive problems. Abatement actions at large installations or on very expensive projects generally must await funding. Installation of electrostatic precipitators at the large Tennessee Valley Authority powerplants is an exception to this situation, because of alternate sources of funds.

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These reports also reflect favorably on the efforts of agencies to comply with the strict sulfur-oxide regulations governing the New York and Chicago standard consolidated areas and the standard Metropolitan Statistical Area of Philadelphia.

Fuels for use in these areas by the civilian agencies are obtained principally by the General Services Administration. Inquiry to the General Services Administration elicited the information that all fuels used in the Chicago standard consolidated area are in conformity with the requirements of the Executive order.

Attempts to secure bids on fuels which would meet the Executive order regulations for New York and Philadelphia failed for the most part. The limited response required a 64 percent premium over costs of existing fuel. Readvertising for a maximum of 1 percent sulfur content brought good response resulting in an 11 percent to 16 percent increase in costs over previous higher sulfur fuels. These responses were considered acceptable. This means that, for these areas, a No. 4 fuel oil with 0.7 percent sulfur and a No. 6 fuel oil with 1.0 percent sulfur maximum will be used for the 1968-69 heating season.

This success in securing fuel oil with 1 percent or slightly less than 1 percent sulfur is encouraging and forecasts a considerable improvement in future sulfur-oxide emissions; additional improvements will accrue as a result of conversions to natural gas.

## V. WASHINGTON, D.C., METROPOLITAN AREA

Considerable progress in controlling air pollution has been made by Federal facilities in the area following the National Capital Metropolitan Area Interstate Air Pollution Abatement Conference held by the Department of Health, Education, and Welfare in December 1967. Open burning has been discontinued at Kenilworth Dump in the District of Columbia and a sanitary landfill has been started. The Department of Health, Education, and Welfare, the Department of the Interior and the government of Washington, D.C. were instrumental in effecting this long-sought change.

The Department of Commerce has completed conversion of the heating plant at the National Bureau of Standards in Gaithersburg, Md., to burn natural gas, with No. 2 fuel oil as standby; and the Treasury Department has modified the classified-waste incinerator at the Bureau of Engraving and Printing in Washington, D.C. Pending funds for replacement, an incinerator at the Agricultural Research Station in Beltsville, Md., has been repaired by the Department of Agriculture.

Conversion of heating plants to burn natural gas is underway at the Goddard Space Flight Center of the National Aeronautics and Space Administration in Greenbelt, Md., and at the National Zoological Park of the Smithsonian Institution in Washington, D.C.

With respect to the Department of Health, Education, and Welfare, the Food and Drug Administration in Beltsville, Md., has reduced particulate emissions from a faulty incinerator by making operational changes; several incinerators have been eliminated on the Howard University campus in Washington, D.C., by transporting refuse to the District of Columbia incinerators; St. Elizabeth's Hospital in the District has contracted for replacement of a faulty pathological incinerator, has installed smoke meters on coal and oil-burning boilers and has secured funds for equipping the main refuse incinerator with air pollution control equipment; the National Institutes of Health in Bethesda, Md., is now using a No. 6 fuel oil with a maximum sulfur content of 0.5 percent, is redesigning classified waste incinerators for installation of both afterburners and water scrubbers, and is engaged in a joint effort with the Department of the Army and the Department of the Navy to design and construct a large general waste incinerator to serve the National Institutes of Health, the Naval Medical Center, and Walter Reed Hospital and Annex. Construction will be at the annex site in Maryland. The Department of the Army has been issued a permit for land use for this project and design has been started.

The General Services Administration, as anticipated, is playing an important role in the Washington, D.C. metropolitan area, as elsewhere, with respect to procurement of low-sulfur fuel. Since November 1967, all fuel oil procured for the Department of Defense facilities in the Washington area by the General Services Administration has contained 2 percent sulfur. For the 1968-69 heating season, fuels have

been secured at 1.5 percent sulfur, which is in accord with the recommendations of the Washington abatement conference. Furthermore, it is expected that for the 1969-70 heating season 1 percent sulfur fuels will be provided. Department of Defense facilities involved are the following:

- Arlington Hall Station, Arlington, Va.;
- Pentagon Building, Arlington, Va.;
- Cameron Station, Alexandria, Va.;
- Fort Belvoir, Springfield, Va.;
- Harry Diamond Laboratories, Washington, D.C.;
- Fort Leslie J. McNair, Washington, D.C.;
- Walter Reed Army Medical Center, Washington, D.C.;
- N. G. Camp Sims, Washington, D.C.;
- Walter Reed Army Medical Center (Forest Glen Annex), Maryland;
- Army Map Service, Montgomery County, Md.;
- Andrews Air Force Base, Maryland;
- Naval Research Laboratory, Washington, D.C.;
- Marine Barracks, Washington, D.C.;
- Naval Communications Station, Cheltenham, Md.;
- Naval Medical Center, Bethesda, Md.; and
- Naval Ordnance Laboratory, White Oaks, Md.

Additional activities of the General Services Administration in this area have resulted in the replacement of three boilers, previously burning number 6 fuel oil, with two gas-fired boilers at the old Bureau of Standards property on Connecticut Avenue in the District of Columbia. The General Services Administration also has reported that all of the major coal-burning steam plants operated by the General Services Administration now are using coal containing 1 percent sulfur or less.

Remaining problems of air pollution abatement in Federal facilities in and around Washington, D.C., generally are minor and work is proceeding on many of these at this time.



## VI. MISCELLANEOUS ACTIVITIES

During calendar year 1968, emission inventories of all 77 Federal facilities in the Kansas City area were completed and entered in the record of the second session of the Kansas City, Kans.-Kansas City, Mo. Interstate Air Pollution Abatement Conference. A similar inventory was completed of the 185 Federal facilities in the Philadelphia, Pa., area in conjunction with the Delaware Valley regional air quality program which is being conducted cooperatively by Federal, State, and local agencies.

In view of the mandate for Federal facilities to exhibit leadership in abating air pollution, inventories of emissions from Federal facilities have been completed in Washington, D.C., New York, Chicago, Philadelphia, Chattanooga, and Detroit and started in Denver, St. Louis, Boston, and San Francisco. Eventually, all 32 regions will be completely inventoried. Information will be helpful to the facilities themselves and will be important in any overall area emission studies which must be carried out before control programs are developed by States and communities concerned within each region.

Special studies also are underway concerning air pollution problems and control practices in Federal foundries, ammonia oxidation plants used to manufacture nitric acid, and sulfuric acid manufacturing plants. Information secured from these studies will be helpful in developing improved control techniques for these air pollutants.

The Department of Defense again has included proposals for control of emissions from the Volunteer Army ammunition plant in Hamilton County, Tenn. Proposals for this plant have been included in fiscal year 1969 plans but were not funded by Congress. This plant probably is the worst single Federal source of air pollution, principally oxides of nitrogen, in the United States. It has been the source of complaints, congressional inquiries and general citizen dissatisfaction in its vicinity. Failure to fund the 1969 project was a distinct disappointment and it is hoped that corrective measures will be funded in fiscal year 1970.

Technical assistance on specific problems associated with boiler operations was given to the Department of Defense, Veterans' Administration, and the Department of Health, Education, and Welfare. Similar help concerning incinerators was given to the Smithsonian Institution and to the Departments of Defense, Interior, and Agriculture.

A conference was held with representatives of the Corps of Engineers (civil works) concerning the disposal of debris from New York Harbor. Representatives of the Corps were reminded that the pit incinerator being constructed at Caven Point, N.J., in its proposed form, may be inadequate to meet the standards concerning particulate emissions. If this should prove to be true following testing of this device, further design and engineering will be necessary to secure compliance with the regulations.



A carbon monoxide control study related to automotive traffic was started at selected border stations at the request of the Public Buildings Service of the General Services Administration.

The Washington, D.C., Air Pollution Division and the National Park Service of the Department of the Interior were advised concerning an incinerator designed for the destruction of brush and logs. These agencies are attempting to dispose of this waste in a manner which hopefully will replace the current open burning. Specialized activities have been continued to assure the control of exhaust products from missiles and rockets powered with highly toxic propellants. These activities involved close cooperation and interagency liaison with the Department of Defense, National Aeronautics and Space Administration, Atomic Energy Commission, Armed Services Explosives Safety Board, and the National Academy of Sciences-National Research Council. During the year, not a single rocket motor containing beryllium propellant was fired in the open air of the continental United States.

In the interest of providing further assistance during the year, the Federal Facilities Section distributed several hundred copies of the 892-page publication titled "Air Pollution Engineering Manual" to the Federal agencies. Also distributed for comment and technical criticism was the "Interim Guide to Good Practice for Selecting Incinerators for Federal Facilities."

The Section also participated in a training course at Durham, N.C., for approximately 70 engineers of the Army Materiel Command and in a seminar at the Army Environmental Health Agency, Edgewood Arsenal, Edgewood, Md., with representatives of the Army Surgeon General's Office, the Bureau of the Budget and the Federal Water Pollution Control Administration, to review the operation of the 5-year phased and orderly plan.

## VII. CONCLUSION

The Federal departments and agencies again this year evidence excellent cooperation with the Department of Health, Education, and Welfare and the Bureau of the Budget for purposes of preventing and controlling air pollution. The reports of progress highlight both the efforts and the intentions of the agencies. With sufficient funding, there is no reason why air pollution control by Federal agencies should not be successful. Announcement of the establishment of the first 32 air quality control regions by the National Air Pollution Control Administration has given further impetus to this program and has defined more sharply than heretofore areas to which specific attention must be provided both by the Federal Government and by State and local organizations.

Sufficient funding will enable prompt abatement of air pollution from Federal establishments.

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APPENDIX A  
FISCAL YEAR 1979 PROJECTS TO BE RECOMMENDED BY THE PRESIDENT

Agency	Institution	Proposed action
Department of Agriculture	Agricultural Research Center, Beltsville, Md.	Construct new incubator for Animal Husbandry Media Laboratory and a new pathological laboratory. Construct new Parasitic Station, size 1. Convert existing Plant Media, size 3 to size 10. Install 3 fuel cells. Convert existing Plant Media, size 3 to size 10. Convert existing Plant Media, size 3 to size 10.
Atomic Energy Commission	Food Materials Production Center, Fernald, Ohio	Install auxiliary heating and 2 central receiver incinerators.
Department of Commerce	Argonne National Laboratory, Argonne, Ill.	Convert heating plant to natural gas.
General Services Administration	U.S. Merchant Marine Academy, Kings Point, N.Y.	Conversion of heating plant to No. 2 fuel oil or to gas with oil standby depending on results of study now underway.
	Post Office and Courthouse, East St. Louis, Ill.	Convert boiler to oil or gas.
	AEC Building, Germantown, Md.	Install wet scrubber on exhausters.
	Military Personnel Records Center, Overland, Mo.	Convert boiler to oil.
	Post Office Building, St. Louis, Mo.	Convert boiler to oil.
	Public Health Service, St. Louis, Mo.	Convert boiler to oil.
	National Zoological Park, Washington, D.C.	Improve control of incinerator by wet scrubber and convert coal incinerator to gas.
	Shawnee steamplant, Jackson County, Ala.	Upgrading electrification of electrically driven pumps on all 10 units.
	Widener Creek steamplant, Jackson County, Ala.	Upgrading electrification of electrically driven pumps on all 2 units.
	Widener Creek steamplant, Jackson County, Tenn.	Upgrading electrification of electrically driven pumps on all 2 units.
	VA Hospital, Butler, Pa.	Replace 3 boilers with 3 boilers burning gas and No. 2 fuel oil.
	VA Hospital, Pittsburgh, Pa. (GB)	Convert 4 boilers to gas and No. 2 fuel oil.
	VA Hospital, Philadelphia, Pa. (RIP)	Convert 3 boilers to gas and No. 2 fuel oil.
	VA Hospital, Cincinnati, Ohio (Fort Thomas)	Convert 3 boilers to gas and No. 2 fuel oil.
	VA Hospital, Brecksville, Ohio	Replace 3 boilers and convert 2 boilers to gas and No. 2 fuel oil.
Department of Defense	Naval Air Station, Alameda, Calif.	Install a 75-ton-per-day strip model smelter complete with dewatering service, automatic control, and automatic control system. Convert existing smelter to gas. Install refractory, an automatic metal reclaiming system, glass recovery, and air pollution abatement control equipment.
	Bradley Air National Guard, Windsor Locks, Conn.	Install smoke density recorder meter on boiler.
	Edin Air Force Base, Ft. Belvoir, Pa.	Install incinerator in mortuary and replace existing incinerator with a new incinerator. Install auxiliary heating and 2 central receiver incinerators. Convert existing Plant Media, size 3 to size 10. Convert existing Plant Media, size 3 to size 10.
	Scott Air Force Base, Belleville, Ill.	Install auxiliary heating and 2 central receiver incinerators. Convert existing Plant Media, size 3 to size 10. Convert existing Plant Media, size 3 to size 10.
	Andrews Air Force Base, Camp Springs, Md.	Install auxiliary heating and 2 central receiver incinerators. Convert existing Plant Media, size 3 to size 10. Convert existing Plant Media, size 3 to size 10.
	McGuire Air Force Base, Burlington County, N.J.	Convert boilers in Buildings 21, 31, 34, 42, to natural gas; Buildings 14-23, 18-47, 24-49, 33-72, 34-59, and 19-48 to No. 2 fuel oil. Same for Building 18-01.



APPENDIX A—Continued  
FISCAL YEAR 1970 PROJECTS TO BE RECOMMENDED BY THE PRESIDENT 1

Agency	Institution	Proposed action
Department of Defense—Continued Army—Continued		
	Frankford Arsenal, Philadelphia, Pa.	Design for conversion from No. 6 oil to combination of No. 2 oil and gas.
	Fert Dux, Burlington, N.J.	Construct steamlines to an oil-fired plant in reception center and then remove oil-fired boiler in building 20.
	Fert Hercules, Highlands, N.J.	Convert fuel system to gas with oil standby at central heating plant.
	Fort Belvoir, Fort Belvoir, Mo.	Reconvert and rebuild incinerators.
	Fort Belvoir, Fairfax County, Va.	Fuel conversion to natural gas with low-sulfur fuel oil as standby for 2 boilers using coal (10-100 M.B.T.U. per hour).
	Fort Meade, Washington, D.C.	Replace underground gasoline storage tank and include submerged type oil pipe to prevent explosion.
	Washington State plant, Warren, Mich.	Convert 12 boilers to gas fuel from coal.
Navy	Naval Air Station, Alameda, Calif.	Provide pressure breather valves for aviation gas storage tanks 87A to 97E; set central at 2.5 p.s.i. Phase out tanks 267A and 347B, fiscal year 1972 or sooner.
	Marine Corps Supply Center, Barksdale, Calif.	Install on-dielectric auxiliary tanks to replace open-top burning.
	Naval Weapons Station, Concord, Calif.	Provide multi-chamber tank installation with automatic shut-off valves and venting system.
	San Francisco Bay Naval Shipyard, Hunters Point, San Francisco, Calif.	Provide fuel line changeover for bunkers in building 311 and building 271. Design and engineering studies to replace a dry pulp paper disinfectant with a wet pulp disinfectant.
	San Francisco Bay Naval Shipyard, Mare Island, Vallejo, Calif.	Improve ventilation of building 53. Increase frequency of cleaning of oil murrhins and replace after jacks in the scrubber more frequently. These changes are directed at odor control from murrhins.
	Fleet Training Center, Naval Station, San Diego, Calif.	Convert fuel system to gas.
	Naval Fuel Depot, San Pedro, Calif.	Installation of a vapor collection and flare system to collect and burn vapors during filling operations for a truck loading facility and four fuel storage tanks.
	Naval Station, Treasure Island, San Francisco, Calif.	Engineering study to provide lightweight filter on cyclone exhaust from a distillate paper desintegrator at building 445.
	Marine Corps Air Station, Kaneohe Bay, Honolulu, Hawaii	Install sanitary flueid to replace open burning camp.
	Fleet Training Group, Pearl Harbor, Honolulu, Hawaii	Design smoke abatement facility for firefighting training school.
	Naval Ordnance Station, Forest Park, Ill.	Design new incinerator with air pollution control equipment.
	Naval Training Center, Great Lakes, Ill.	Install stillburner system to eliminate smoke from the firefighting training school.
	Naval Air Station, Olathe, Mo.	Design smoke control system for firefighting training school.
	Naval Shipyard, Boston, Mass.	Design and engineering studies to replace a dry pulp paper disinfectant with a wet pulp disinfectant.
	Naval Construction Battalion, Charleston, W. Va.	Install wet scrubber to control emissions from refuse incinerator.
	Naval Ship Research and Development Center, Carderock, Md.	Install smoke detectors on heating plant in building 6.
	Naval Ammunition Depot, Erie, N.J.	Convert from No. 4 residual fuel oil to No. 2 distillate oil; eliminate open burning and disposal of limbers by a chipper.
	Naval Air Station, Brooklyn, N.Y.	Convert from No. 4 residual fuel oil to No. 2 distillate in building No. 6 and buildings No. 4, respectively.
	Naval Hospital, St. Albans, N.Y.	Convert from No. 6 residual fuel oil to No. 2 distillate oil in building 64.
	Naval Supply Center, Craney Island, Norfolk, Va.	Installation of smoke detectors and alarms on boilers; provide waste oil degradation to replace white oil jet.
	Naval Damage Control Training Center, Philadelphia, Pa.	Construct smoke elimination system for this fire center.

Corps of Engineers (civil functions)..... Patuxent and Annapolis Rivers, Washington, D.C. .... Install inclinometer to measure drift and debris collected from these rivers. May be open-  
 Pit type or mounted on a barge. Decision rests upon prototype open-pit device operation  
 ..Cape Point, N.J.  
 ..Install overline air pit inclinometer at Fort McHenry.  
 ..Continue interim landfill operation and conduct engineering study to determine best  
 ..method of landfill operation.  
 ..Install inclinometer at ..Cape Point, N.J., or recorder on vessel.  
 ..Lake Michigan.  
 ..Dipper dredge "Keweenaw".

<sup>1</sup> Tentative listing supplied by the Bureau of the Budget, Dec. 27, 1968.



APPENDIX B  
SUMMARY OF REMEDIAL ACTIONS BY FEDERAL DEPARTMENTS OR AGENCIES, FISCAL YEAR 1966

Department or agency	Program reports	Remedial actions	Stopped open burning or non-incineration	New or upgraded incinerators	Replacement of heating plants	Existing heating plants improved	New or improved particulate collectors	Smoke or other monitor systems installed	Using lower sulfur content coal or fuel oil	Converted heating plant from oil to gas	Converted to electricity	Reduced chemical or vapor emissions	Other
<b>Grand total.....</b>	<b>387</b>	<b>442</b>	<b>126</b>	<b>9</b>	<b>14</b>	<b>7</b>	<b>8</b>	<b>16</b>	<b>103</b>	<b>27</b>	<b>1</b>	<b>31</b>	<b>99</b>
Defense:													
Army.....	115	115	25	3	1	1	3	4	3	1	1	7	12
Navy.....	10	10	13	2	1	1	2	1	1	1	1	15	1
Air Force.....	10	10	1	1	1	1	1	1	1	1	1	1	1
Supplies.....	1	1	1	1	1	1	1	1	1	1	1	1	1
Comptroller of the Treasury.....	1	1	1	1	1	1	1	1	1	1	1	1	1
Atomic Energy Commission.....	15	20	3	1	1	1	1	3	1	1	1	2	1
Commerce.....	3	4	1	1	1	1	1	1	1	1	1	1	1
General Services.....	11	11	1	1	1	1	1	1	1	1	1	1	1
Health, Education, Welfare.....	11	11	1	1	1	1	1	1	1	1	1	1	1
Interior.....	20	20	1	1	1	1	1	1	1	1	1	1	1
Justice.....	1	1	1	1	1	1	1	1	1	1	1	1	1
National Aeronautics and Space.....	3	3	1	1	1	1	1	1	1	1	1	1	1
Post Office.....	1	1	1	1	1	1	1	1	1	1	1	1	1
Smithsonian Institution.....	1	1	1	1	1	1	1	1	1	1	1	1	1
Tennessee Valley Authority.....	4	4	1	1	1	1	1	1	1	1	1	1	1
Transportation.....	1	1	1	1	1	1	1	1	1	1	1	1	1
War Relocation Authority.....	1	1	1	1	1	1	1	1	1	1	1	1	1
Veterans' Administration.....	14	14	1	1	1	1	1	1	1	1	1	1	1

1 "Other action" includes studies, designs, and project cost estimates completed or underway. It also includes contracts awarded or advertised for bid.

APPENDIX C  
ANNUAL REPORT OF PROGRESS BY INSTALLATION DURING FISCAL YEAR 1968

Agency	Installation	Actions
Department of Defense: Defense Supply Agency	Defense Supply Support Center, Philadelphia, Pa. ....	Conversion of clean boiler to gas-oil firing completed February 1968.
	Fort McClellan, Aberdeen, Md. ....	Open burning discontinued during fiscal year 1968.
	Redstone Arsenal, Huntsville, Ala. ....	Installed vapor emission control devices in steam tanks during fiscal year 1968.
	Fert Rocker, Daleville, Ala. ....	12 cast-iron boilers replaced by 10 converted to oil or gas during fiscal year 1968.
	Fort Richardson, Anchorage, Alaska ....	Construction contract awarded January 1968. Completion scheduled for October 1968.
	Fort Winifred, Fairbanks, Alaska ....	Open burning discontinued and sanitary landfill established in fiscal year 1968.
	Yuma Proving Ground, Yuma, Ariz. ....	Open burning discontinued and sanitary landfill established during fiscal year 1968.
	Ft. Chaffee, Fort Smith, Ark. ....	Open burning discontinued and sanitary landfill established during fiscal year 1968.
	Pera Blvd Arsenal, Fort Smith, Ark. ....	Open burning and white phosphorus slag eliminated (shipping slag to TVA). Resurfacing of parking area completed during fiscal year 1968. Sanitary landfill established during fiscal year 1968.
	Hammer Lignit Military Reservation, Johns, Calif. ....	Design study for air quality control facility made in July 1967.
	Flintstones General Hospital, Aurora, Colo. ....	Sanitary landfill for refuse disposal established during fiscal year 1968.
	Rocky Mountain Arsenal, Denver, Colo. ....	Discontinued use of one incinerator during fiscal year 1968.
	Fort Lathrop, Washington, D.C. ....	5 monitoring stations installed March 1968. Submerged tanks at 2 storage tanks. Fiscal year 1968.
	Fort Lathrop, Washington, D.C. ....	Replaced fuel oil with a maximum sulfur content of 2 percent has been used since July 1, 1967.
	Walter Reed Army Medical Center (Main), Washington, D.C. ....	1967.
	Alameda Army Depot, Forest Park, Ga. ....	Submerged tanks installed on all underground tanks during fiscal year 1968.
	Fort Gordon, Augusta, Ga. ....	256 cast-iron furnaces removed from construction area. 4 gasoline tanks removed during fiscal year 1968.
	Fert Harrison, Atlanta, Ga. ....	Open burning discontinued. Waste disposed off post.
	Chicago USAF Center No. 1 (Midland), Chicago, Ill. ....	Fuel oil condensing atmosphere of 1 percent sulfur has been used since Dec. 1, 1967.
	Chicago USAF Center No. 2 (Gibson), Chicago, Ill. ....	Do.
	Chicago USAF Center No. 3 (Lincolnwood), Chicago, Ill. ....	Do.
	Chicago USAF Center No. 4 (Wentworth), Chicago, Ill. ....	Do.
	Chicago USAF Center No. 5 (Northbrook), Chicago, Ill. ....	Do.
	Chicago USAF Center, Chicago, Ill. (South O'Hare) ....	Do.
	Chicago USAF Center, Chicago, Ill. (South O'Hare) ....	Do.
	Fort Army Ammunition Plant, Joliet, Ill. ....	Preliminary engineering studies made on testing of emissions from manufacturing process. Regulating design contract for upgrading cast-iron heating plants. Installing lower sulfur fuel and oil.
	Missile site C-48, Arlington Heights, Ill. ....	Fuel oil containing maximum of 1 percent sulfur has been used since Dec. 1, 1967.
	Rock Island Arsenal, Rock Island, Ill. ....	Fuel oil and 50 percent sulfur has been used since Dec. 1, 1967.
	Fort Sheridan, Highland Park, Ill. ....	Fuel oil containing maximum of 1 percent sulfur has been used since Dec. 1, 1967. Construction contract awarded January 1968 to convert heating plant from coal to gas. Completion date November 1968.

APPENDIX C—Continued  
ANNUAL REPORT OF PROGRESS BY INSTALLATION DURING FISCAL YEAR 1962—Continued

Agency	Installation	Actions
Department of Defense—Continued Army—Continued	Windsor USAR Center, Washington, D.C.	Fuel oil containing maximum of 1 percent sulfur has been used since Dec. 1, 1967.
	Camp Atterbury, Edinburg, Ind.	Construction of new heating system discontinued. Waste disposal and incinerator established. Fuel year 1968. Approved design contract Apr. 30, 1968 to convert above plant from coal to natural gas and No. 2 fuel oil standby.
	Fort Knox, Louisville (Hartley, Meade, Beville Counties), Ky.	Open burning discontinued in fiscal year 1968.
	Army Map Service, Washington, Md.	Residual fuel oil containing maximum of 2 percent sulfur used since July 1, 1967.
	Fort George G. Meade, Quantico, Md.	Smoke detectors and recorders installed on 10 boilers. Fuel oil used since July 1, 1967.
	Water Road Army Medical Center Annex, Fort Detrick, Md.	Residual fuel oil containing maximum of 2 percent sulfur has been used since July 1, 1967.
	Beane Army Base, Boston, Mass.	Smoke detectors installed on 8 boilers in the Central Boiler Plant September 1967.
	Fort Devens, Ayer, Mass.	Contract awarded to convert 8 coal-fired boilers and 1 oil coal-fired heating system to oil-burned before 1968-69 heating season.
	Fort Meade, Meigs, Md.	Eight coal-fired boilers changed to gas in fiscal year 1968.
	Bayona military ocean terminal, Bayonne, N.J.	Fuel oil processed for use after May 1, 1968, will meet New Jersey State sulfur limit.
	Burlington Army ammunition plant, Burlington, N.J.	Fuel oil processed after May 1, 1968, will meet New Jersey State sulfur limit.
	Garrison USAR Center, Camden, N.J.	Fuel oil containing maximum sulfur content of 1 percent in use since Nov. 1, 1967. Oil processed after May 1, 1968, will meet New Jersey State sulfur limit.
	Fort Dix, Wrightstown, N.J.	Fuel oil containing 1 percent sulfur in use since Nov. 1, 1967. Prior to sulfur limit with 0.9 percent sulfur in use since Nov. 1, 1967. Fuel oil processed after May 1, 1968, will meet New Jersey State sulfur limit.
	Fort Hancock, Highlands, N.J.	Fuel oil used since Nov. 1, 1967, contains 1 percent maximum sulfur content. Processing of fuel oil with maximum sulfur content of 1 percent for fiscal year 1968, Feb. 1, 1968, will meet New Jersey State sulfur limit.
	Kearny USAR Center, Kearny, N.J.	Fuel oil used since Nov. 1, 1967, contains 1 percent maximum sulfur content. Fuel oil processed after May 1, 1968, will meet New Jersey State sulfur limit.
	Camp Kilmer, Edison, N.J.	Fuel oil used since Nov. 1, 1967, contains 1 percent sulfur maximum. Fuel oil processed after May 1, 1968, will meet New Jersey State sulfur limit.
	Alexander Hamilton USAR Center, Lodi, N.J.	Fuel oil used since Nov. 1, 1967, contains 1 percent sulfur maximum. Fuel oil processed after May 1, 1968, will meet New Jersey State sulfur limit.
	Fort Monmouth, Eatontown, N.J.	All open burning discontinued as of May 22, 1967, and refuse bailed in longshore. Fuel oil used since Nov. 1, 1967, contains 1 percent sulfur and oil processed after May 1, 1968, will meet New Jersey State sulfur limit. Fuel oil processed after May 1, 1968, will meet New Jersey State sulfur limit.
	Fort Monmouth Subport, Charles Wood Area, N.J.	Fuel oil used since Nov. 1, 1967, contains 1 percent sulfur and oil processed after May 1, 1968, will meet New Jersey State sulfur limit. Fuel oil processed after May 1, 1968, will meet New Jersey State sulfur limit.
	Sgt. J. J. Sedwinski USAR Center, Newark, N.J.	Fuel oil used since Nov. 1, 1967, contains 1 percent sulfur and oil processed after May 1, 1968, will meet New Jersey State sulfur limit.

Nixon USAR Center, Nixon, N.J.-----  
 Picatinny Arsenal, Dover, N.J.-----  
 Fuel oil procured after May 1, 1968, will meet New Jersey State sulfur limits.  
 Discontinued burning and use of incinerator. Landfill established. Fuel oil used since Nov. 1, 1967, contains 1 percent sulfur, and oil procured for use after May 1, 1968, will meet New Jersey State sulfur limits. Bituminous coal for use in fiscal year 1969 being procured with maximum sulfur content of 1 percent. Design contract being negotiated for fuel conversion to gas.  
 Philadelphia Air Defense Site, Pottersville, N.J.-----  
 Fuel oil used since Nov. 1, 1957, contains 1 percent sulfur, and oil procured after May 1, 1968, will meet New Jersey State sulfur limits.  
 Trenton USAR Center, Trenton, N.J.-----  
 Fort Wingate Army Depot, Gallup, N. Mex.-----  
 Open burning replaced by landfill in March 1967. Construction contract awarded Apr. 30, 1968, to convert coal-fired boilers to gas.  
 Army Pictorial Center, New York City (Long Island City), N.Y.-----  
 Fuel oil used since Nov. 1, 1967, contains 1 percent sulfur maximum.  
 Brooklyn military ocean terminal, New York (Kings County), N.Y.-----  
 Fort Hamilton, Brooklyn, N.Y.-----  
 Fuel oil used after May 31, 1969, will contain 1 percent sulfur maximum.  
 Brig. Gen. T. Roosevelt, Jr. USAR Center, Hempstead, N.Y.-----  
 Smoke receptors installed on 2 boilers. Test oil used since Nov. 1, 1957, contains 1 percent sulfur maximum. Design contract being negotiated for upgrading incinerators.  
 Miller Army Airfield, Staten Island, N.Y.-----  
 Do.-----  
 Seaside Army Depot, Seaside, N.Y.-----  
 Do.-----  
 S. Sat. V. O. Kelly USAR Center, New York City (West 42d St.), N.Y.-----  
 Do.-----  
 2d Lt. Thomas J. McDonald USAR Center, New York City (Goethals Ave., Jamaica), N.Y.-----  
 Do.-----  
 Service Army Depot, Pottersville, N.Y.-----  
 Fuel oil used since Nov. 1, 1967, contains 1 percent sulfur maximum.  
 Fort Tilden (USAR) Center, New York City, N.Y.-----  
 Fuel oil used since July 31, 1967.  
 Fort Totten, New York City, N.Y.-----  
 Inactive since July 31, 1967.  
 USA Directorate General Support Maintenance Activity, Baltimore, N.Y.-----  
 Fuel oil used since Nov. 1, 1957, contains 1 percent sulfur maximum.  
 Fort Wadsworth, New York City, N.Y.-----  
 Do.-----  
 Water-reject Arsenal, Watervliet, N.Y.-----  
 Fort Briggs, Fayetteville, N.C.-----  
 Unstable Army Depot, Herndon, N.C.-----  
 Open burning discontinued during fiscal year 1968. Wastes removed by contract.  
 Open burning discontinued during fiscal year 1968.  
 Frankfort Arsenal, Philadelphia, Pa.-----  
 Cancelled.  
 Norristown US-9 Center, Norristown, Pa.-----  
 Vetsky Forge General Hospital, Phoenixville, Pa.-----  
 Horsesham USAR Center, Willow Grove, Pa.-----  
 Camp Bullis, San Antonio, Tex.-----  
 Fort Hood, Bell and Coryell Counties, Tex.-----  
 Fort Sam Houston, San Antonio, Tex.-----  
 Red River Army Depot, Tarrant County (Bowie County), Tex.-----  
 Do.-----  
 Do.-----  
 Do.-----  
 Rubber previously burned is now stockpiled for future sale. Submerged inlets installed on 2 tanks during fiscal year 1968.  
 Camp Stanley, San Antonio, Tex.-----  
 Fort Totten, General Wells, Tex.-----  
 Fort Worth, Texas-----  
 Arlington Hall Station, Arlington, Va.-----  
 Fort Belvoir, Fort Belvoir, Va.-----  
 Cameron Station, Alexandria, Va.-----  
 Do.-----  
 Do.-----  
 2 fuel converters (coal to oil) were accomplished. Design completed for proposed conversion to gas with oil standby.

APPENDIX C—Continued

ANNUAL REPORT OF PROGRESS BY INSTALLATION DURING FISCAL YEAR 1962—Continued

Agency	Initiation	Action
Department of Defense—Continued Army—Continued	Fort Myer, Arlington, Va.	Residual fuel oil used since July 1, 1967, contains 2-percent sulfur maximum.
	Fort Hill, Fairfax Station, Va.	250,000 gallons of fuel oil used since July 1, 1967, contains 2-percent sulfur maximum.
	Fort Lewis, Tacoma, Wash.	500,000 gallons of fuel oil used since July 1, 1967, contains 2-percent sulfur maximum.
	Fort Meade, Fort Meade, Md.	250,000 gallons of fuel oil used since July 1, 1967, contains 2-percent sulfur maximum.
Corps of Engineers	Fort Belvoir, Fort Belvoir, Mo.	250,000 gallons of fuel oil used since July 1, 1967, contains 2-percent sulfur maximum.
	Fort Belvoir, Fort Belvoir, Mo.	250,000 gallons of fuel oil used since July 1, 1967, contains 2-percent sulfur maximum.
	Fort Belvoir, Fort Belvoir, Mo.	250,000 gallons of fuel oil used since July 1, 1967, contains 2-percent sulfur maximum.
	Fort Belvoir, Fort Belvoir, Mo.	250,000 gallons of fuel oil used since July 1, 1967, contains 2-percent sulfur maximum.
Navy	Naval Air Station, Alameda, Calif.	250,000 gallons of fuel oil used since July 1, 1967, contains 2-percent sulfur maximum.
	Naval Air Station, Alameda, Calif.	250,000 gallons of fuel oil used since July 1, 1967, contains 2-percent sulfur maximum.
	Naval Air Station, Alameda, Calif.	250,000 gallons of fuel oil used since July 1, 1967, contains 2-percent sulfur maximum.
	Naval Air Station, Alameda, Calif.	250,000 gallons of fuel oil used since July 1, 1967, contains 2-percent sulfur maximum.



Marine Corps Supply Center, Albany, Albany, Ga. ....	Engineering study complete. (Recommends sanitary landfill to replace 2 open-burning dumps.)
Naval Air Station, Barber's Point, Barber's Point, Honolulu, Hawaii .....	Final plans and specifications being prepared for sanitary landfill.
Naval Ordnance Station, Forest Park, Ill. ....	Fuel procured since Nov. 1, 1967, has contained a maximum of 1 percent sulfur.
Naval Air Station, Glenview, Ill. ....	Do.
Navy Public Works Center, Great Lakes, Great Lakes, Ill. ....	Contract awarded for firm gas for the main powerplant effective Nov. 1, 1968, for \$5 percent of annual fuel. Contract awarded for design of control devices for main powerplant. Fuel used since Nov. 1, 1967, has had a limit of 1 percent sulfur.
Naval Training Center, Great Lakes, Great Lakes, Ill. ....	Project cost estimate completed for freighting school smoke elimination facility.
Public Works Center, Guam, Orote Point, Guam .....	Plans completed for a sanitary landfill.
U.S. Naval Academy, Annapolis, Md. ....	New heating plant under construction. Estimated completion date, November 1968.
Naval Research Laboratory, Chesapeake Beach, Md. ....	Smoke de'ectors ordered.
Naval Ordnance Laboratory, Silver Spring, Md. ....	Design project underway (to control incinerator smoke).
Pat. Shipyard, Boston, Boston, Mass. ....	Project cost estimate completed Aug. 15, 1967, for boiler smoke control and refuse disposal.
Naval Auxiliary Air Station, Fallon, Nev. ....	Open-burning discontinued; exhaust mases hauling to on-station landfill operated by 1958.
Naval Ammunition Depot, Hawthorne, Hawthorne, Nev. ....	Sulfur merged inlet, on motor gasoline storage tanks to be completed by June 30, 1968.
GoldSborough Housing (part of Supply Center) Bayonne, N.J. ....	Design completed fiscal year 1968. Disposal of waste anticipated June 30, 1968. Installation will be for Army.
Reserve Training Center, Clifton, N.J. ....	Fuel procured since Nov. 1, 1967, has contained 1 percent sulfur maximum.
Ammunition Depot, Entle, N.J. ....	Do.
Reserve Training Center, Elizabeth, N.J. ....	Do.
Reserve Training Center, Jersey City, N.J. ....	Do.
IND Reserve Shipyard, Newark, N.J. ....	Do.
Reserve Training Center, Freeport, N.J. ....	Do.
Headquarters, 1st Marine Corps District, Garden City, N.Y. ....	Do.
Mitchel Barron, Federal Housing Annex of Naval Station, Brooklyn, Garden City, N.Y. ....	Do.
Reserve Training Center, Huntington, N.Y. ....	Do.
Naval and Marine Corps Reserve Training Center, Fort Schuyler, N.Y., Bronx, New York .....	Do.
Shipyard (Naval Station, Brooklyn) Brooklyn, Kings County, N.Y. ....	Design authorized for special project AI-48 (incinerator scrubbers).
Naval Air Station, New York City, New York City, N.Y. ....	Fuel procured since Nov. 1, 1967, has contained 1 percent sulfur maximum.
Naval Air Station, New York, Brooklyn, N.Y. ....	Fuel procured since Nov. 1, 1967, has contained 1 percent sulfur maximum. Plans and specifications completed for boiler replacement building 4-B. Project cost estimate for launch gas piping to launch activity.
Hospital, St. Albans, St. Albans, Queens County, N.Y. ....	Fuel procured since Nov. 1, 1967, has contained 1 percent sulfur maximum. Special project with certificate of urgency approved by EASTDIV for scrubber and modifications in fiscal year 1968. Project cost estimate completed for boiler conversion in fiscal year 1968.
Reserve Training Facility, Youngtown, N.Y. ....	Special project completed in fiscal year 1968. EASTDIV approval anticipated in May 1968.
Naval Air Development Center, Johnsville, Pa. ....	Fuel procured since Nov. 1, 1967, has contained 1 percent sulfur maximum. Negotiations underway for selecting A. & E. firm to prepare project cost estimate (contract conflict).





Williams Air Force Base, Chandler, Ariz. .... Improvements in auto maintenance shop scheduled for fiscal year 1969. Submerged inlets on 3 50,000-gallon tanks.

McClellan Air Force Base, Sacramento, Calif. .... Waste lumber disposal contract expected to be completed by June 1968.

Vandenberg Air Force Base, Santa Barbara County, Calif. .... Waste recovery valves on 4 underground fuel storage tanks.

Lovely Air Force Base, Denver, Colo. .... Distillers ash handling equipment installed at heating plant during 3d quarter fiscal year 1968. Refuse disposal accomplished by sanitary landfill operation.

Robins Air Force Base, Warner Robins, Ga. .... Building 210 connected to central heating plant by sanitary landfill operation.

Bellefonte Air Force Station, Bellefonte, Ill. .... Open burning of scrap lumber temporarily terminated. Anticipating 1 furnace problem. Available land is limited so incinerator planned for fiscal year 1972.

Chanute Air Force Base, Chanute, Ill. .... Remedial action not required. Phaseout scheduled for July 1969.

Hanna City Air Force Station, Hanna City, Ill. .... Remedial action not required. Phaseout scheduled for July 1969.

Sioux City Air Base, Sioux City, Iowa. .... Remedial action not required. Facilities being turned over to ANG and Sioux City effective September 1968.

Snow Mountain Air Force Station, Fort Knox, Ky. .... Cyclone separator no longer needed. Phaseout scheduled for July 1969.

Barksdale Air Force Base, Bossier City, La. .... Classified waste eliminator installed. Conversion scheduled to start before Dec. 31, 1969, on nonpolluting waste disposal system for a new composite medical facility. Design underway.

Andrews Air Force Base, Camp Springs, Md. .... Contract for oil-base refuse disposal eliminates need for incinerator. Design underway to convert boilers in building 1515 to oil.

L. G. Hanscom Field, P.L.N. 1849, Bedford, Mass. .... Smoke detection and recorder system accomplished in December 1967.

Westover Air Force Base, Chicopee, Mass. .... Open burning eliminated with sanitary landfill. Close monitoring of heat plant operation.

Calumet Air Force Base, Calumet, Mich. .... Fuel conversion to oil in gas included in project to enlarge plant. Expected completion date September 1969.

Port Austin Air Force Station, 80 miles southeast of Saginaw, Mich. .... Design in progress for fuel conversion to natural gas to be effected in early 1969.

Selindgo Air Force Base, Mount Clement, Mich. .... Installation of submerged inlet lines in 500-gal. gasoline storage tanks. Completed November 1967.

Recluse Air Force Base, Blount, Miss. .... Design completed and construction contract awarded in April 1968 for combination shredder-incinerator. Facility expected to be in operation by September 1969.

Aeromedical Chart and Information Center, St. Louis, Mo. .... Phaseout scheduled September 1969.

Kirkville Air Force Station, Kirksville, Mo. .... DO.

Omaha Air Force Station, Omaha, Neb. .... DO.

McGuire Air Force Base, Burlington County, N.J. .... Low sulfur No. 4 fuel oil purchased for building 33-42. New boilers fired with No. 2 fuel oil installed for buildings 27-43, 27-35, 28-19, and 28-34.

National Guard Air Base, Floyd Bennett Field, N.Y. .... ANG securing low sulfur fuel oil to comply with emissions standards.

Pittsburgh Air Force Base, Pittsburgh, N.Y. .... Open burning discontinued. Refuse to be disposed in sanitary landfill.

Fortuna Air Force Station, Fortuna, N. Dak. .... Design for new boilers completed; when installed fuel to be used in sanitary landfill.

Grand Forks Air Force Base, Grand Forks, N. Dak. .... Fuel conversion from coal to oil scheduled for July 1, 1963.

Minot Air Force Station, Minot, N. Dak. .... Design completed and project authorized for bid advertisement. (Conversion of heating plant to gas.)

Lockbourne Air Force Base, ANG Facility, Columbus, Ohio. .... Purchasing low sulfur oil to comply with emission standards.

Wright-Patterson Air Force Base, Green County, Ohio. .... New incinerator installed in building 205, area B. Replaced all cones on mechanical collector for No. 2 better CIP 1246 (HIV). Contaminated POL to be sold rather than burned.

Altus Air Force Base, Altus, Okla. .... Refuse disposed off base in sanitary landfill operation.

Kingsley Field, Klamath Falls, Oreg. .... Submerged inlets on fuel tanks installed.

Greater Pittsburgh Airport, Pittsburgh, Pa. .... Submerged inlets on fuel tanks.

Willow Grove Air Reserve Facility, Willow Grove, Pa. .... No. 6 fuel oil containing 0.8 percent sulfur now being procured. Seeking oil containing 0.6 percent sulfur.

APPENDIX C—Continued  
ANNUAL REPORT OF PROGRESS BY INSTALLATION DURING FISCAL YEAR 1968—Continued

Agency	Installations	Activities
Department of Defense—Continued Air Force—Continued	Air Force Commission.....	Open burning of refuse eliminated using auxiliary landfill. Commissary incinerator being used by base commissaries.
	Atomic Energy Commission.....	Research and development of incineration equipment on classified equipment incinerator. Incorporated control equipment on steam plant at EBR II site.
Atomic Energy Commission.....	Argonne National Laboratory, Du Page County, Ill.....	Requested funds to convert plant to natural gas. Funds denied by Joint Committee on Atomic Energy.
	Berkeley plant, Los Alamos, N.M.....	Contract for engineering and design let on May 1, 1968, to convert steam plant from coal to natural gas and standby fuel oil. To be completed by October 1969.
Atomic Energy Commission.....	Pedestal Geopress Division Plant, Paducah, Ky.....	Work started on rebuilding electrostatic precipitators on steam plant C-400.
	Beaumont plant, Kansas City, Mo.....	Equipment ordered to install gas afterburner and flow gas washer with stock classified waste destructor in April 1968. Completion scheduled August 1968.
Atomic Energy Commission.....	Brookhaven National Laboratory, Suffolk County, N.Y.....	Requested funds to convert steam plant to natural gas. Request denied by Joint Committee on Atomic Energy.
	Kudat Atomic Power Laboratory, Schenectady County, N.Y.....	Changed fuel oil contract to less than 2 percent sulfur oil. Installed submersed filling inlet on 10,000-gal. storage tank. Currently establishing viable disposal of wastes to replace open burning.
Atomic Energy Commission.....	Oak Ridge Operations Feed Materials Production Center, Hamilton County, Tenn.....	Smoke density recorder installed in 2 of 4 stacks. Studies of electrostatic precipitator for removal of particulates.
	Oak Ridge Operations Office, Portsmouth Area Geopress Division Plant, Portsmouth, Ohio.....	Stack sampling and other studies involving back draft conditions to insure economics of various remedial measures including electrostatic precipitation, smoke density recorder, and fly ash equipment.
Atomic Energy Commission.....	Savannah River Operations Office, Savannah River Plant, Aiken and McCormick Counties, S.C.....	Sanitary landfill being developed to eliminate open burning. Study regarding need for electrostatic precipitators in progress.
	Oak Ridge Operations Office, Portsmouth Area Geopress Division Plant, Portsmouth, Ohio.....	Yearly maintenance contract awarded to control oxidation vapor loss.
Atomic Energy Commission.....	Oak Ridge Operations, Oak Ridge Geopress Division Plant, Oak Ridge, Tenn.....	Funds budgeted for installation of smoke density recorder. Steam plant being studied regarding need for electrostatic precipitators and smoke density recorder.
	Oak Ridge Operations, Oak Ridge Steam Plant, Building 1918-1-2A, Oak Ridge, Tenn.....	Study underway to determine feasibility of installing gas-fired boilers to eliminate smoke problem in restricted area.
Atomic Energy Commission.....	General Services Administration.....	Sanitary landfill operation installed to eliminate open burning of 2.5 tons of refuse per day.
	General Services Administration.....	17 smoke density recorders have been preserved for use at this point.
General Services Administration.....	Federal Center Building 47, Denver, Colo.....	Feijl commercial construction contract awarded in April 1968. Completion scheduled for Nov. 15, 1968. Converting from coal to gas and No. 2 fuel oil.
	Engineered Postal Station, Chicago, Ill.....	Fuel conversion project out on bid. Coal to gas testing plant.
General Services Administration.....	Post Office Building, New York, N.Y.....	Study for conversion of coal to gas and No. 2 oil.
	Post Office Building, 20th St. and M Ave., Brooklyn, N.Y.....	Project for conversion of coal to gas and No. 2 oil.
General Services Administration.....	Federal Office Building, 39 Ryerson St., Brooklyn, N.Y.....	Conversion of boilers to gas and No. 2 fuel oil underway. Completion date, Oct. 1, 1968.
	Post Office Building, New York, N.Y.....	Do.
General Services Administration.....	Post Office Building, New York, N.Y.....	Do.
	Post Office Building, New York, N.Y.....	Do.

admission Service Post Office, New York, N.Y. ....	(In 50.
Post Office, Rochester, N.Y. ....	
North Philadelphia Post Office, Philadelphia, Pa. ....	
2500 Washington Ave., Philadelphia, Pa. ....	
National Bureau of Standards, Gaithersburg, Md. ....	
Nobelen Terminal, Hoboken, N.J. ....	
U.S. Merchant Marine Academy, Kings Point, Long Island, N.Y. ....	
Italian Hospital, Phoenix, Ariz. ....	
Quarantine Clinic, Chicago, Ill. ....	
PHS Hospital, Lexington, Ky. ....	
PHS Hospital, Washington, D.C. ....	
PHS Hospital, Boston, Mass. ....	
PHS Hospital, Staten Island, N.Y. ....	
Quarantine Station, Staten Island, N.Y. ....	
Quarantine Clinic, Philadelphia, Pa. ....	
Northeast Marine Health Science Laboratory, Harri- ersett, N.J. ....	
PHS Hospital, Norfolk, Va. ....	
St. Elizabeth's Hospital, Washington, D.C. ....	
Glasgow Coast Guard Base, Gloucester City, N.J. ....	
Coast Guard Training Center, Cape May, N.J. ....	
New York Coast Guard Base, Governors Island, N.Y. ....	
Elizabeth City Coast Guard Air Base, Elizabeth City, N.C. ....	
Mt. Edgecumbe Boarding School, Sitka, Alaska ....	
China's Agency Headquarters, China, Ariz. ....	
Indian Agency Headquarters, Kansas Canyon, Standing Rock Boarding School, Fort Yates, N. Dak. ....	
Seneca Indian School, Wyandotte, Okla. ....	
Ogish Community School, Pine Bluffs, S. Dak. ....	
PHS Day School, Pine Bluffs, S. Dak. ....	
Indian Agency School, Indian City, Ind. ....	
National Park Service, Grand Canyon National Park, Grand Canyon, Ariz. ....	
Camp Outlook NWR, Carlsville, Ill. ....	
Bureau of Sport Fisheries and Wildlife. ....	
Department of Commerce. ....	
Department of Health, Education, and Welfare: Public Health Service. ....	
Department of Transportation. ....	
Department of the Interior: Bureau of Indian Affairs. ....	
Conversion of boilers to gas and No. 2 fuel oil initiated. Conversion of boiler to gas and No. 2 fuel oil completed. Conversion of boiler to gas and No. 2 fuel oil completed. Contract has been let for conversion of heating plant to gas and specially fuel oil. Property is under lease to Port of New York Authority. Authority has been assigned to convert to No. 2 fuel oil in summer of 1958. Lower sulfur fuel oil now being used. A contract has been let to study the feasibility of using high-pressure boiler or converting to No. 2 fuel oil. Multiple chamber incinerator has been installed replacing single chamber unit. Unit burning discontinued and sanitary landfill operating. On market to obtain lower sulfur fuel oil. Do. Converted to No. 2 fuel oil. Design for residual conversion to gas is 80 percent complete. Converted to No. 2 fuel oil. Converting to lower sulfur fuel oil. Invitation to bid to be the market for lower sulfur fuel oil. Invitation to bid to be the market for lower sulfur fuel oil. Converted to No. 2 fuel oil. Contracts awarded for smoke meters on boilers, installation of afterburner, basement damper, overfire ventilation, and burners in main incinerator. Heating system converted from No. 5 residual fuel oil to No. 2 distillate oil. Open burning of refuse has been discontinued. Refuse now compacted, collected, and disposed of in new service. Partial conversion from residual fuel oil to No. 2 distillate fuel oil. Will be completed when funds are available. Open burning of waste discontinued. Use of compactors and public disposal facilities accomplished. Incinerator set on bid to eliminate open burning. Feasibility study in progress to determine modification of heating plant. Stack sampling to be done to check emissions from No. 5 fuel oil. Preliminary investigation for heating plant modification to include air pollution abatement equipment has been made. An incinerator is being considered. Heating plant converted to No. 2 fuel oil. Boiler has been converted to No. 2 fuel oil. Coal fired boilers are abandoned. New converting centralized heating plant to No. 2 fuel oil. Will be converted to No. 2 fuel oil for the heating plant. New converting centralized heating plant to No. 2 fuel oil. New converting centralized heating plant to No. 2 fuel oil. Incinerator prepared for 1957 and 1958 fiscal year for 1958. South Bin Patents totaling 9 of 15 locations under lease with Bureau of Sport Fisheries and Wildlife. Have been notified to comply with Executive Order 11582. 4 other installations are to be No. 2 fuel oil or gas. Open burning has been eliminated and a sanitary landfill installed.	









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OPERATING EXPERIENCE WITH MET-DOLOMITE SCRUBBING

by

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OPERATING EXPERIENCE WITH WET-DOLOMITE SCRUBBING

In September 1967, Combustion Engineering, Inc. and Union Electric Co. announced plans to install a full-scale sulfur dioxide removal system on one of the units at Union Electric's Meramec plant in St. Louis County. The system was developed by Combustion Engineering and utilizes limestone or dolomite injection into the furnace and a wet scrubber for particulate and sulfur dioxide removal. Results of laboratory tests and field tests of a pilot system at the St. Clair plant of Detroit Edison Co. were reported at the American Power Conference in April, 1967.<sup>1</sup>

The system was designed and installed on the Meramec No. 2 unit during the period October 1967 to June 1968 (Fig. 1). Initial operation was deferred until September 1968 to avoid the summer high-load period. The system was operated initially on natural gas beginning September 9, 1968 and initially with coal on September 19. During the period September 1968 to May 1969, the system operated on coal for 31 days.

Operation of the system has revealed problems that were not evident during initial experience with the pilot plant at Detroit Edison. It is the purpose of this paper to describe this operating experience, the modifications that have been made to the system, and the plans and expectations for the future.

Description of System

A schematic of the sulfur dioxide removal system is shown in Fig. 2. Crushed limestone is delivered to the plant by truck and unloaded into a hopper normally used for rail coal unloading. The coal conveyer system is used to transport the limestone to

the No. 2 unit coal bunker. During this operation, coal cannot be transported to the plant. The No. 2 bunker has been partitioned to separate the limestone above the "A" pulverizer from the coal above the other three pulverizers.

The boiler-turbine unit has a maximum capability of 140-Mw. This capacity can be obtained with three pulverizers when the pulverizers are in top grinding condition. Some loss in unit capacity can be expected as the pulverizers wear, since the fourth pulverizer is used for limestone.

The "A" pulverizer and exhaustor system pulverizes the limestone and injects it above the coal flame from the other burners. The "A" burners have been disconnected from the burner tilt mechanism and are fixed in a 15° upward position. The electrostatic precipitators have been blanked off with one half of the blanking plates at inlet and outlet welded in place and the other half being bolted. This is done so that the bolted plates can be removed during a short outage and the generating unit operated with flue gas going through the precipitator while modifications are made to the SO<sub>2</sub> removal system.

A closed loop, liquid heat exchanger system is provided to extract heat from the flue gas ahead of the scrubbers and to reheat the flue gas after the scrubbers. The system is designed to reheat the flue gases 50 F for plume appearance, primarily.

Two National Dust Collector Hydro-Filter scrubbers are installed to operate in parallel (Fig. 3). Power-operated inlet and outlet dampers are provided for control to maintain a minimum gas velocity through the marble bed and for isolation of each scrubber.

Flue gas enters the scrubber beneath the marble bed and flows through the bed and out the top of the scrubber. Water sprays are located beneath the marble bed and are directed upward. The high-pressure drop through the marble bed causes the water spray to be broken up into a turbulent layer of water mist which traps the particulate matter. Water and collected particles overflow into drains which discharge below the bed. A gravity drain line from each scrubber discharges water and collected particles to the clarifier.

Solids are concentrated in the clarifier and pumped to a disposal pond. Most of the water is clarified and recycled to the scrubber.

The flue gases pass from the marble bed through a demister and the reheater and then to the induced-draft fan.

#### Expected Performance

Based on the pilot plant experience, Combustion Engineering has guaranteed that the air pollution control system (APCS) would perform as follows:

1. The sulfur oxides leaving the APCS are equivalent to burning a fuel containing 0.5% sulfur when sulfur in the fuel is no greater than 3.4%.
2. The particulate matter removal from the flue gas entering the APCS will be 99%.

#### Operating Experience

##### I. D. Fan Inlet

The reheater is a finned tube heat exchanger with close spaced tubes and fins. Cleaning of the heat exchanger was intended to be done by a water wash system using the scrubber spray

water. The wash system consisted of sprays located above and below the reheater. Originally it was planned that washing would be done at half load with the scrubber inlet and outlet dampers closed. The final design was worked out with on-line washing planned.

After approximately 12 hours of operation on coal, the wash system was operated to determine whether it would function properly. Some of the wash water carried over to the I.D. fans. It was observed to be leaking out of access doors in the fan inlet boxes. After a few hours, I.D. fan vibration increased. Inspection showed a heavy buildup of deposits on the fan blades with a thickness as great as 1 in. in spots. Sand blasting was required to remove the deposits.

It was apparent from this experience that moisture must be kept out of the fans. Drains were installed initially on the fan inlet boxes. These were later changed to an eductor system. Also, top reheater sprays would not be used when the scrubber was on line and bottom sprays would be used carefully.

No further problems were experienced with fan blade deposits. Normally there is no moisture carryover from the reheater. Moisture has been observed coming from the inlet box drains during start-up and during single-fan operation.

#### Overflow Drains

Another early problem was the deposit of calcium sulfate on the overflow drain screens (Fig. 4a). These deposits formed in a short period of time (less than 24 hours) in sufficient amount to restrict the water flow and cause a high water level



in the scrubber. The screens were redesigned to increase the size of openings and were painted with a polyurethane coating which has been found to reduce deposits (Fig. 4b). From the data obtained since making the above change, this problem seems to be solved.

#### Marble Bed Plugging

When operation of the system for periods longer than a few days was undertaken, the problem of plugging of the marble bed was observed. The bed would become inactive at the gas inlet end of the scrubber and this would progress until, on one occasion, more than 50% of bed area became plugged. High velocity in the active portion of the bed would cause carryover of water and solids resulting in deposits on the demister and the reheater.

Model tests of the scrubber were made by Combustion Engineering first using a water table and later using a three-dimensional air-flow model. Poor gas distribution was found as illustrated in the photograph of the water table in Fig. 5a. A series of ladder vanes, demonstrated by model tests, corrected the gas distribution problem (Fig. 5d). These were installed and the scrubber system was operated for six days without bed plugging. It would appear that this problem has been corrected, although a longer period of operation is needed to be certain.

#### Reheater Plugging

As previously described, the marble bed plugging caused carryover of water and solids to the demister and reheater.

As a result, the reheaters of both scrubbers became severely plugged so that the APCS was inoperable. Efforts to remove deposits by sandblasting and high pressure water-jetting were only partially successful. Due to the very close spacing of the finned tubing, sandblasting and water-jetting could not penetrate deep enough to completely clean the heaters. During a six-day period of operation with the reheater partially cleaned and scrubber bed operating properly, continued buildup of deposits on the reheater was observed despite frequent off-line water washing. Inspection of deposits on the reheaters indicated that when the scrubber bed was operating properly, dry deposits formed on the reheaters. In addition, data showed that the reheater surface could be reduced. Because of these two observations, the reheater surface in one scrubber was reduced 40% and manually-operated air soot blowers were installed and tested for 30 hours. No plugging occurred.

As of this writing, the lower half of the reheaters in both scrubbers has been removed and retractable air soot blowers are being installed. The lower half of the reheater held the heavy deposits. It is thought that the soot blowers will maintain acceptable cleanliness of the reheaters with the marble bed operating properly.

#### Scrubber Inlet Deposits

Possibly, the most difficult problem of all has been the buildup of deposits at the scrubber inlet. Model tests showed part of the problem as being a boundary-layer separation (Fig. 5b) which could be corrected by installation of turning

vanes in the inlet duct. After the turning vanes were installed (Fig. 5c), the deposit problem continued. This deposit builds up to the point where the inlet dampers become inoperable. Various configurations of inlet duct extension into the scrubber have been tried with some significant improvement being experienced on the most recent test run. All scrubber inlets are now being modified. However, to insure control, a half-retract soot blower is being installed in each inlet to remove deposits which may still occur.

#### Sulfur Dioxide Removal

Guaranteed sulfur dioxide removal efficiency has been obtained for short periods. This has required a greater use of additive than expected (130% to 140% vs 110% of stoichiometry). Spray water entering and leaving the clarifier has a pH of 9 to 10 instead of the 6 to 7 expected. Tests of slurry leaving the clarifier show a significant amount of reactive additive. It appears that a substantial portion of the limestone additive is removed below the marble bed and drains directly to the clarifier where some of it goes into solution as calcium hydroxide and is used in the scrubber for sulfur dioxide removal and some is removed with the ash and precipitated sulfates and pumped to a slurry pond.

It is now planned to recycle a portion of the clarifier underflow in order to utilize the additive more efficiently.

#### Particulate Removal

Tests have not been performed to determine particulate removal efficiency. However, stack appearance approximates that of an adjacent unit which has a high-efficiency electrostatic

precipitators. Dust loading tests are planned during the next operating period.

### Clarifier System

The clarifier and slurry pumping system has operated successfully with only minor problems evidenced at this time. Plugging of the pump suction has occurred a number of times due to restrictions caused by power-operated butterfly valves. These have been changed to plug valves to minimize the restriction. Solids concentrations of 20 to 30% by weight have been measured in the clarifier underflow. A short term concentration of 50% by weight was measured on one occasion.

### Plume Heating System

Except for the reheater plugging previously described, the heat exchange system has operated satisfactorily. Flue gas temperature entering the reheater has typically been 120 F and has been 190 to 200 F leaving the reheater. As expected, a vapor plume exists when temperature and humidity conditions dictate. During moderate weather, a vapor plume frequently exists during night and early morning hours and disappears as ambient temperatures increase and reappears in the evening.

While plume appearance is still important and of concern, the experience with I.D. fan blade deposits suggests a compelling reason for plume reheating that was not apparent before. It is doubtful that fan blade deposits can be avoided if reheating is not provided.

### Boiler Operation

Minor modifications were made to the limestone pulverizer

to minimize rejects which were quite high in early operation. A new feeder drive was installed to give better control in the 1 to 3 rpm range needed for this system.

No problems have been experienced with the furnace and convection pass of the boiler, with one exception. Buildup of deposits were found in the vicinity of steam aspirated  $O_2$  probes which were backwashed with water. These will probably be changed to air cleaning probes. Fall out of solids increased in the air heater hopper requiring more frequent emptying of the hopper. This was particularly troublesome at half load when one scrubber was operated and gas velocities leaving the air heater were low. Some modification to the air heater hopper and to the removal system will probably be required.

#### Future Plans

As of this writing, plans are to start up the APCS about June 1, 1969. Work on modifications is going ahead, but construction trade labor disputes may delay the completion of this work. If delays are encountered, it may be necessary to postpone the operation of the system until fall to avoid possible forced outages of the unit during peak load periods.

It is expected that a portion of the clarifier underflow will be recycled to determine if additive loss can be reduced. A long operating period is needed to determine reliability of the system and to establish operating and maintenance costs.

#### Summary

Operation of the APCS has revealed problems that were not evident in the small pilot plant which was operated at one of

Detroit Edison's plant. This in itself is not surprising, since the extrapolation from a small pilot plant to a full-scale unit of the Meramec size must be done with considerable risk. Combustion Engineering and Union Electric recognized that this would be a development project and that inevitable problems would occur which would require design changes. To be candid, we should say that trouble occurred where we did not expect trouble and did not occur, as yet, where we expected it.

In the seven and one-half months since the system was first started, there have been 31 days that the system has operated on coal. A number of modifications have been made. Most of the major problems appear to have been corrected, but more operating time is needed to confirm this. The system is now out of service for further modifications and we expect to start up again in June.

The system has demonstrated that it will remove the amount of sulfur dioxide expected although complete and formal acceptance tests have not been performed. Particulate removal has not been determined. Although the system cannot be considered commercially acceptable at this time, a great deal has been learned from this development project and both Combustion Engineering and Union Electric are optimistic about the ultimate workability of the system.

An extended period of operation is planned in order to establish the reliability of the system and to determine operating and maintenance costs. After having obtained this information, we will be able to determine the applicability of the system for both existing and new large units.



Reference

1. Plumley, A. L., Shidcen, O. D., Shutko, F. W., and Jonakin J., "Removal of  $\text{SO}_2$  and Dust from Stack Gases" PROCEEDINGS OF THE AMERICAN POWER CONFERENCE, Volume XXIX, 1967

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1. McLaughlin, J. F. and Jonakin, J., " $\text{SO}_2$  Trapped In Full Scale System, "ELECTRICAL WORLD, November 13, 1967
2. Jonakin, J. and McLaughlin, J. F., "Operating Experience with the First Full Scale System for Removal of  $\text{SO}_2$  and Dust from Stack Gases", American Power Conference, April 1969

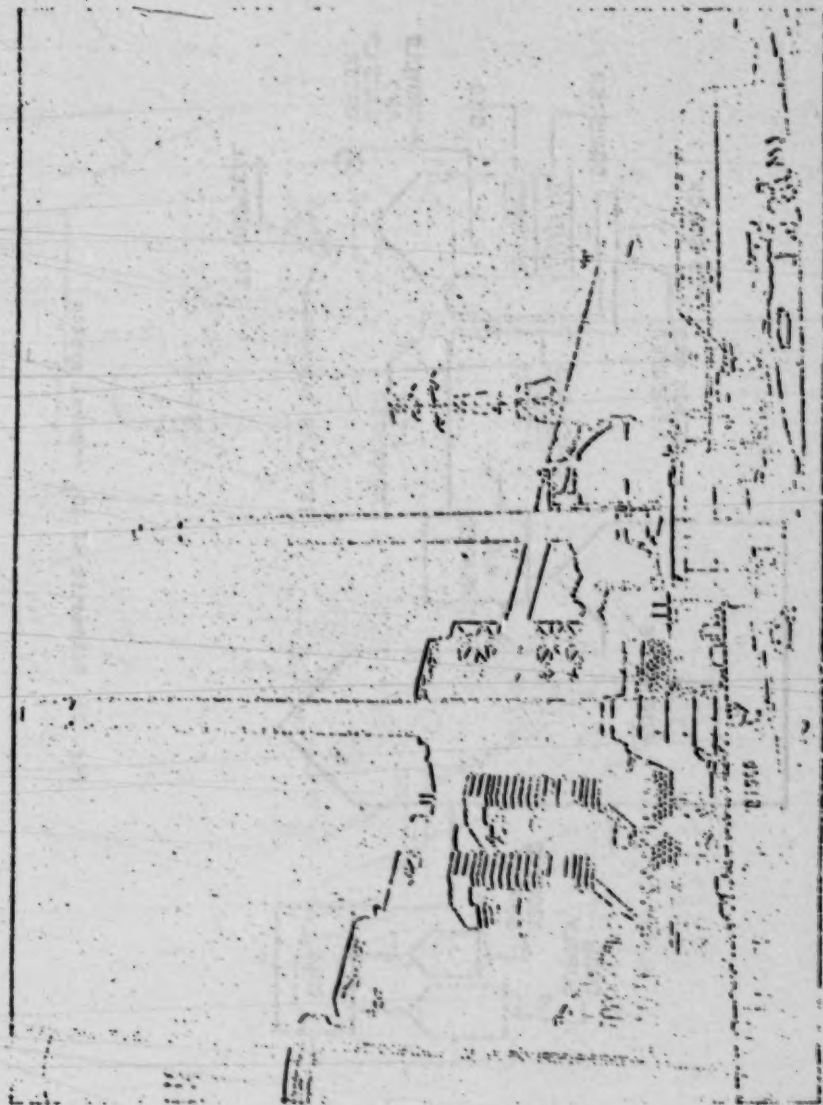


Fig. 1: Air pollution control system installed at Meramec Station of Union Electric Co.

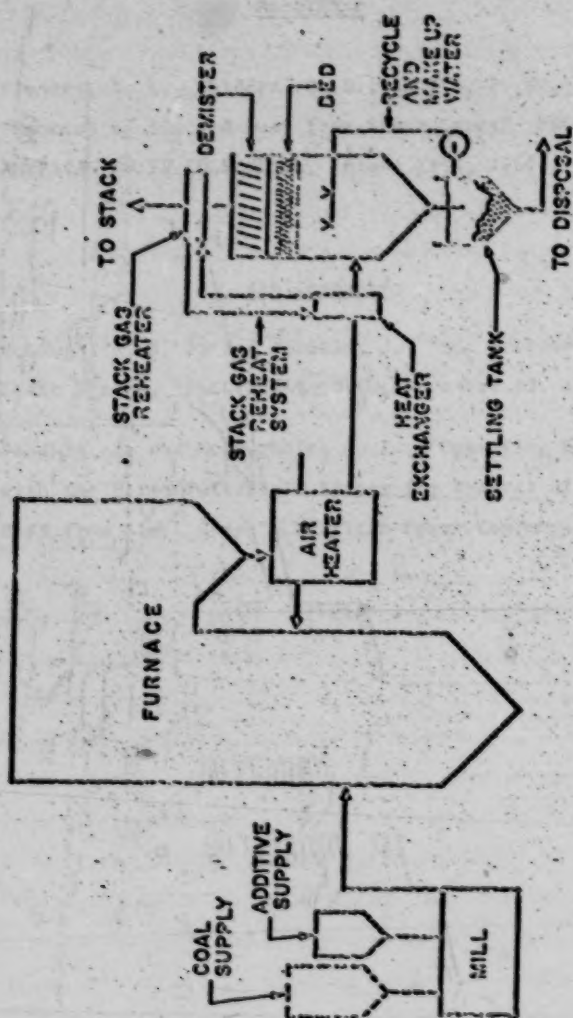


Fig. 2: Schematic of  $\text{SO}_2$  removal system

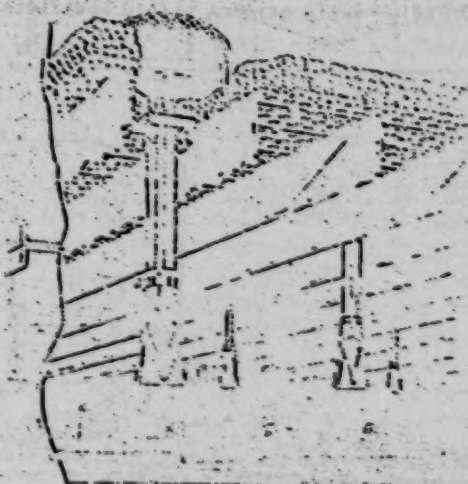
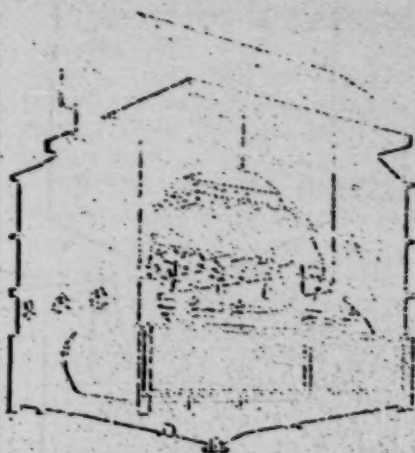


Fig. 3: Ket scrubber

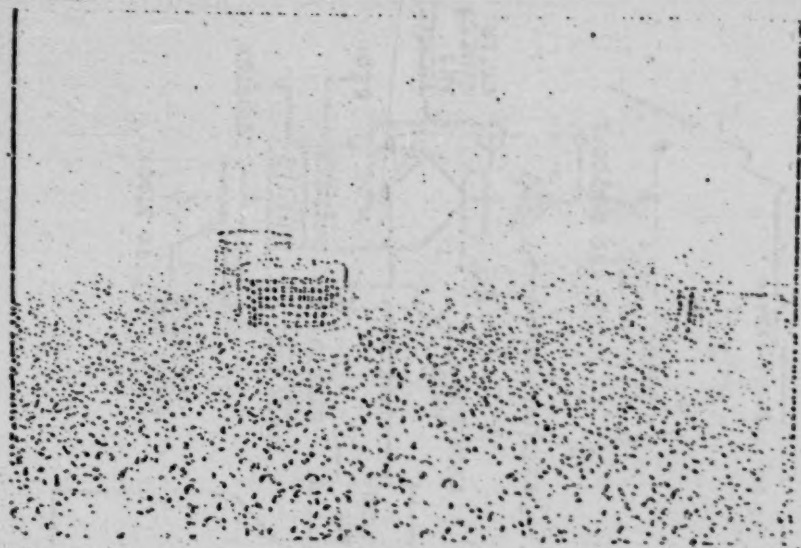


Fig. 4a: Overflow drain screens before modification



Fig. 4b: Overflow drain screens after modification

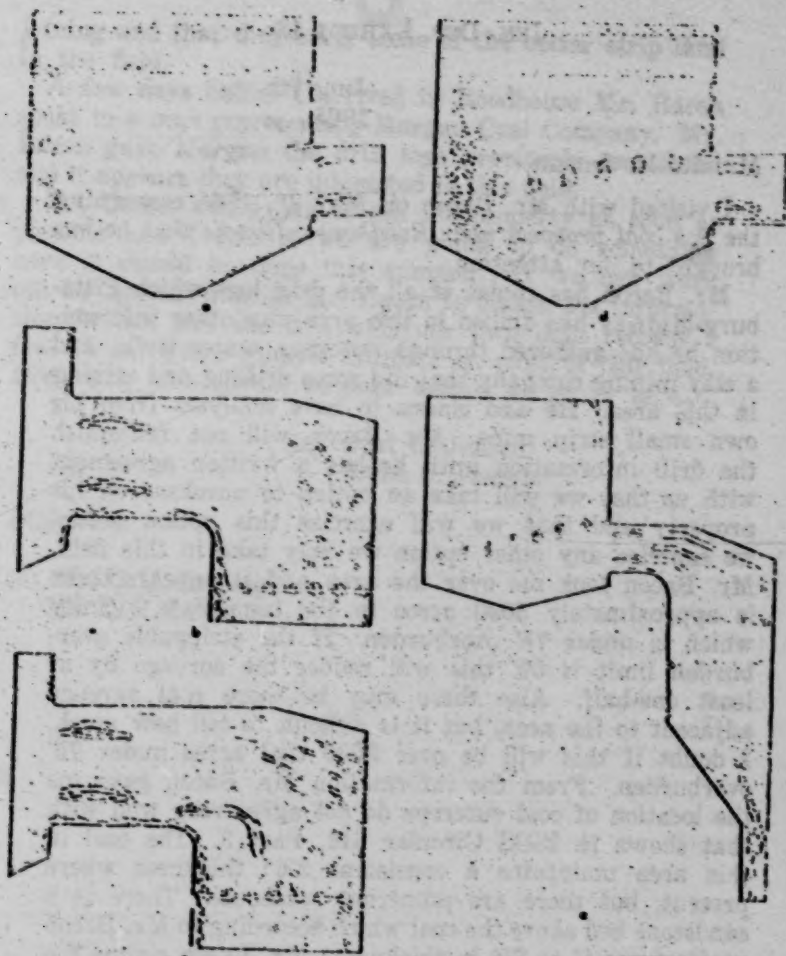


Fig. 5: Water table models of scrubber and duct work — a. showing poor distribution; b. close-up of inlet showing dead boundary layer condition; c. turning vane which eliminates boundary layer condition; d. ladder vanes which eliminate poor distribution under bed; and e. overall view with modifications installed.



## JEN. DEP. EXHIBIT 12

June 7th  
1965

Mr. R. H. Inman

I visited with Mr. Bacon on May 28, 1965 concerning the #2 coal prospect near Roodhouse, Illinois that he has brought to our attention.

Mr. Bacon has copies of all the drill logs which Pittsburgh-Midway has drilled in this area plus other information he has gathered through outcrops, water wells, and a clay mining company that did some drilling and mining in this area. He also claims to have analyses from his own small strip mine. Mr. Bacon will not relinquish the drill information until he has a written agreement with us that we will take an option to purchase on his property and that we will exercise this option before we exercise any other option we may take in this field. Mr. Bacon took me over the area and it appears there is approximately 5000 acres in the immediate vicinity which is under 75' overburden. If the strippable overburden limit is 50' this will reduce the acreage by at least one-half. Also there may be more coal acreage adjacent to the area, but it is difficult to tell how much. I doubt if this will be over 3000 coal acres under 75' overburden. From the information Mr. Bacon gave me the location of coal outcrops do not agree very well with that shown in ISGS Circular 311, Part 3. The coal in this area maintains a consistent 2'6" thickness where present, but there are numerous washouts. There is a sandstone bed above the coal which according to Mr. Bacon varies from 5' to 20' in thickness. Mr. Bacon claims the sandstone is hardest near the outcrop, but becomes soft and friable under deeper overburden. Also in this area there is a lens of coal which is locally as much as 8' thick and called the Roodhouse coal. Its areal extent is not known.

Ayrshire has exercised three options within this area. I don't have these plotted, but I know they are not ad-

joining and that they cover some of the better strip land in the field.

A few days before I arrived in Roodhouse Mr. Bacon spoke to a man representing Morgan Coal Company. Mr. Bacon gave Morgan the drill logs previously mentioned and it appears they are interested in this field.

Mr. Bacon would like to sell his property as soon as possible and I feel if we are going to do something here it should be done this summer. If we can work out an agreement with Mr. Bacon to obtain the information he has and use this with our own drill records I feel we can get a reliable estimate on most of this field. Preferably this should be done before we go in here.

/s/ Burl C. Jensen  
BURL C. JENSEN

BCJ/ah

cc: Mr. D. H. Emling  
Mr. T. H. Latimer

## JEN. DEP. EXHIBIT 13

June 7th

1966

Mr. R. H. Inman

**ROODHOUSE FIELD**

In the main body of this field there is an estimated potential of about 10,000,000 tons with an average overburden of 50', using a 70' maximum overburden as cut-off for the estimate. As the coal averages 2'6" thick, this would give a maximum ratio of 32 and an average ratio of 23. Most of the property we have optioned in this area is not within this 10,000,000 ton area, therefore, we have only a limited amount of drilling to estimate from. We do not know the extent of the faults in the area and those could affect the tonnage estimates either way with the possibility of decreasing the estimate. As you know, Ayrshire has retained land in this field. Within the estimated 10,000,000 ton area they have a total of 635 acres with about 350 coal acres containing approximately 1,220,000 tons of strip coal.

There is another potential area less than 1 mile to the west across Wolf Run Creek which may contain 5,000,000 tons of strip coal with less than 70' overburden. The drilling here is scattered and the area still needs to be proven. We do have a few options in this area which indicate the presence of a possible 5,000,000 tons.

We also have an isolated option on the Stechol property about 6 miles east and 2 miles north of the main Roodhouse Field. This area is in the bottom land of Apple Creek, but does offer the possibility of picking up additional strip coal if the bottom land is minable. The Stechol 260 acre option contained 189 acres of coal or 659,000 tons with an average ratio of 28.

The general terrain of the Roodhouse area is filled with gullies and could contain several million tons under 70' of overburden, but would be narrow strips of contour

mining. No estimate was made of these areas, although much of the options that we had taken lie in this type of terrain.

In 1948 we drilled in an area about 5 miles to the south. The area is near the town of Wrights and offers the possibility of adding additional tonnage to the field. There is approximately 480 acres of drilled coal reserves with less than 70' of overburden in this area. The average coal thickness is 2'6" with a ratio of 23, giving a total drilled coal reserve of 1,670,000 tons with the possibility of gaining additional reserves on adjacent properties. This reserve is bisected by the C. B. & Q. Railroad which would require mining two separate areas.

The C. M. & O. Railroad lies about 3 miles west of the western edge of the 10,000,000 ton Roodhouse area. The C. M. & O. intersects with the C. B. & Q. about 3 miles south at Whitehall, Illinois. The Illinois River is approximately 15 miles in a straight line west of this field.

If the potential of this field is satisfactory and we intend to prospect the area further it is recommended that we keep all or a part of only 8 of the 17 options, and pick up more options in the areas offering the greatest strip potential which we are now better suited to choose.

Below is a summary of each of the tracts we have options on in the Roodhouse Field. The drilling in this field was done by John Hoskins Company.

- 1—Wagner, 160 acres. The minimum overburden is 60' and the ratio is 40 cu. yds. The cost per ton would be 10¢ on 561,000 tons estimated. Earned royalty is 15¢ per ton. Recommend that this be dropped because of the high overburden.
- 2—L. Gilmore, 65 acres. This would be cropline mining in hollows only. Recommend we drop this.
- 3—K. Henneberg, 120 acres. This tract is in the estimated 5,000,000 ton area as mentioned above and should be kept. There is 100 acres of coal and 337,000 tons. The overburden is from crop to a maximum of 71' with an average ratio of 26 and a cost per ton of 12.5¢ or an earned royalty of 15¢ per ton.

- 4—W. VanSicson, 195 acres. There is 170 acres of coal. The overburden is outcrop to 90' with an average ratio of 32. The cost per ton would be 11.5¢. The lower overburden in this estimate is crop-line mining, therefore I recommend it be dropped.
- 5—M. Tillery, 160 acres. This is in the 10,000,000 ton area and I recommend that we keep only 40 acres. This is an isolated 40 acres from the other 120 acres in the option and contains all the coal. Cost per ton on 160 acres is 39¢, but the cost per ton on the 40 acres would be approximately 10¢ or 15¢ earned royalty. Average ratio is 20 and the overburden is 35' to 52'. Estimated 144,000 tons.
- 6—P. Bell, 260 acres. Recommend that it be dropped. There are 225 acres of coal or 758,000 tons. Overburden is 40' to 80' with an average ratio of 31. Mostly cropline mining, but some of it is in the 5,000,000 ton area. Cost per ton is 12¢. Earned royalty is 15¢.
- 7—W. Gilmore, 618 acres. Recommend that this be dropped. 160 acres of coal or 557,600 tons under 70' of overburden, but would be cropline mining. Cost per ton would be 39¢.
- 8—E. Spencer, 417 acres. This is divided up into several separate tracts. Recommend that it be dropped. Practically all would be cropline mining and hollows or mining of deep overburden over 70'.
- 9—H. Strammatt, 120 acres. Recommend that it be dropped. Only 30 acres of coal or 105,000 tons. Would be cropline mining and cost per ton would be 40¢ and the average ratio is 23.
- 10—A. Ontousn, 80 acres. This tract is in the 5,000,000 ton area. Recommend that we keep it. There is 75 acres of coal or 253,000 tons. Cost per ton would be 11.1¢ or 15¢ earned royalty. Average ratio is 26. Overburden ranges from 30' to 70'.
- 11—J. Sheppard, 172 acres. Recommend that we keep 80 acres which is in the 10,000,000 ton area. This 80 is separate from the other 92 acres in the option. There are 26 acres of coal or 91,000 tons. The cost

- per ton would be 66¢ on the 172 acres, but 30.8¢ on the 80 acres. Average ratio is 15 and the overburden is from outcrop to 45'.
- 12—M. Townsend, 42 acres. Recommend we drop this as it will be all cropline mining.
  - 13—L. H. Hubbard, 160 acres. This option is divided into two separate tracts. I recommend that we drop the 90 acre tract which contains only 10 acres of coal or 34,850 tons. Cost would be 90¢ per ton, however, if we plan further prospecting in this area we recommend we keep the 70 acre tract since it is lying in the 5,000,000 ton area. There is not enough drilling on this to provide an estimate at this time.
  - 14—W. L. Allen, 40 acres. Recommend that we keep this. Contains 30 acres of coal and is located in the 10,000,000 ton area. It is estimated to be 105,000 tons with an overburden range from cropline to 44' and the average ratio is 16. The cost per ton would be 13.3¢ or 15¢ earned royalty.
  - 15—R. A. Smith, 202 acres. Recommend that this be dropped. 179 acres of coal would be cropline mining and the plus 70' of overburden, however, there is 582,000 tons with an average ratio of 23. Cost per ton would be 12.2¢ or 15¢ earned royalty.
  - 16—S. Steckel, 260 acres. Recommend that we keep this tract. It is the isolated tract in the Apple Creek bottom and contains 189 acres in less than 70' of overburden. The estimated tons is 659,000 with an average ratio of 25. Cost per ton would be 13.8¢ or 15¢ earned royalty.
  - 17—R. Pollack, 240 acres. Recommend that this be kept. There are 147 acres of coal or 512,000 tons. It is located in the 10,000,000 ton area. The average ratio would be 20. Overburden ranges from outcrop to 56'. The cost per ton would be 16.4¢ or 15¢ earned royalty.

It should be kept in mind however that if we do keep any of these tracts, we, under previous agreement are obligated to take the Bacon option. On the Bacon tract we had estimated 181,000 tons. The cost per ton here



would be 19¢, but if you include the Model 702 Kochring dragline, the cost per ton would be 23¢.

It should also be noted that on the list of options that should come up before the Board meeting, those listed beginning with Albert Bateman in Green County expire in September rather than August as stated on the list. If there was another Board meeting in August we still would have approximately 90 days to decide on these 8 tracts. These represent 6 of the 8 tracts that we would consider keeping if we intend to prospect this field further. The other 2 that we recommend to keep—Hanneberg is in the 5,000,000 ton area and the Kenneth Tillery which we suggest we keep only 40 acres possibly could be dropped and if anything developed we could pick these up at a future date. In the meantime this would give us approximately 90 days before the others were expired to pick up additional tracts where we feel the greatest potential lies and give us a better chance to rule on the Roodhouse Field. I had only noticed that these dates were wrong since we last talked about the Roodhouse Field.

Attached are 2 copies each of the analyses of 4 cores taken at the Roodhouse Field. Also attached is an average of these 4 analyses along with the comparison study of the No. 2 coal in other areas of Illinois.

We now have on file, Corps of Engineer maps and 15' quadrangles of the area.


DHE & BCJ/ah

D. H. EMLING

B. C. JENSEN

## COMPANY

## PROGRESS



For thirty-eight years your Company has been engaged in a single business—mining bituminous coal by the strip or open pit method and marketing that coal in the Midwest.

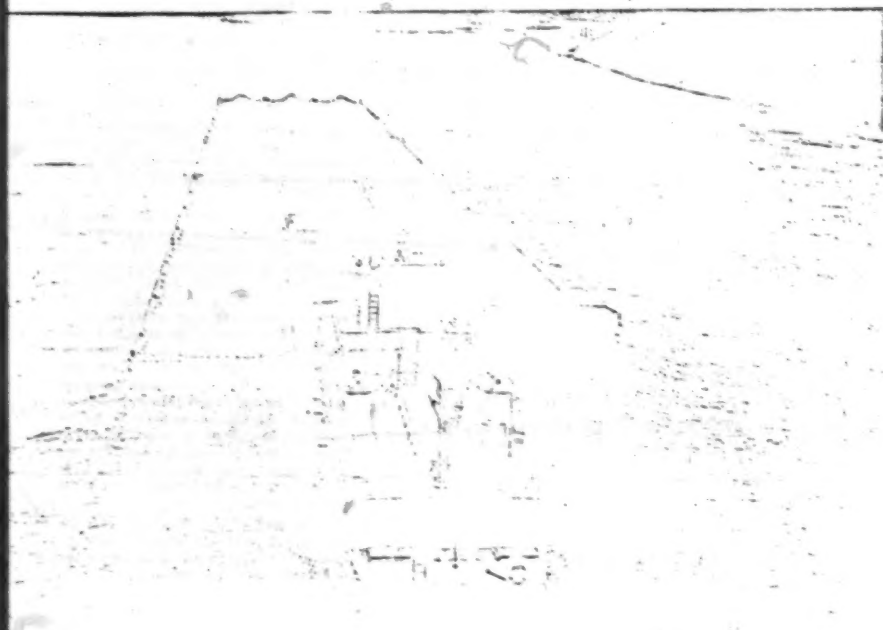
The coal seam in a strip mine must lie closer to the surface than in an underground mine. In our method of mining, the coal is uncovered by removing the dirt, rock, and shale with large earth moving machines. These machines represent a larger investment in equipment than would be necessary for a comparable operation in underground mining. Strip mining, however, has resulted in a higher output per man-day which, in the face of constantly increasing labor costs, has placed these mines in an excellent position competitively in the industry. The increase by your Company in tons produced per man-day has been two and one-half times the gain by all bituminous mines in the United States in the last ten years.

The progress of your Company over the past several years may be more clearly understood by noting some of its specific developments and improvements.

The use of this excavator in a pit with a shovel makes possible the recovery of coal with overburdens up to 100 feet. Three or four times as much material is moved in a month with "wheels" as was moved with the draglines they replaced. The use of a "wheel" with a shovel permits the shovel to operate at its greatest efficiency. Drilling and blasting from the ledge created by a "wheel" on the digging side of the pit reduces those costs because the material moved to form the ledge does not have to be drilled or blasted. The much wider pits made possible with the use of wheel excavators has improved the operating performance of the entire pit including the coal loading shovels and truck haulage units. The "wheel" and a shovel working together can economically strip coal which could not have been mined before at a profit.

**HAULING COAL** In order to reduce the cost of transporting coal from the pit to the preparation plant, we are using larger truck haulage units than formerly. We have recently acquired our first fifty-ton trucks which will haul about 50% more than the units they replaced.

**PREPARATION OF COAL FOR SHIPMENT** Modern industrialization makes great demands on the washing, sizing, and quality preparation of coals. All of our mines are equipped with preparation plants designed to meet these demands. Our two most recently constructed plants are of the new "heavy media" design. These "heavy media" plants provide a finer,



**DRILLING** At some mines rock present in the ground overlying the coal adds a problem to the removal of the overburden—the material above the coal. The rock must be drilled and blasted before it can be moved.

We have met this problem by designing and developing a new rotary type drill. This drill, using compressed air rather than water to bring up the drill cuttings, is completely self-propelled and has a single drill stem long enough to permit the drilling of a complete hole. The footage drilled per man-hour has doubled in the last three years with the use of this drill.

**BLASTING ROCK** When the drilling is completed, the holes are filled with explosives which, when detonated, break the rock material to a size that can be moved. During the period of a year we use several million pounds of explosive for this purpose.

The cost of this operation was substantially reduced when we inaugurated the use of a new explosive a year ago. After years of research we discovered this compound, called Unimite, which had the qualities of strength, compactness, and safety so valuable for our needs. We are making this explosive from its basic ingredients on our mine property. Unimite not only gives us a cost savings per pound but permits drilling fewer holes—over 50% greater recovery per hole drilled.

**STRIPPING** Stripping is essentially a tremendous earth moving process and is performed by developing a long ditch or pit down to the coal, moving the material off the coal along one side of the pit and depositing it on the other side. By continuing this operation, always working in the same general direction, the open pit is gradually moved along exposing the coal which can then be removed. In stripping overburden, which is usually the most costly operation at a strip mine, your Company has made particularly important progress.

The conventional machinery used for this work has been a shovel or a dragline in pits of about 50 feet or less. In pits higher than 50 or 60 feet a dragline may be able to operate alone but usually a shovel and a dragline are necessary. These shovels are highly efficient machines but experience has shown that draglines usually result in high cost operations. As low overburden stripping reserves become increasingly difficult to find, this cost problem has become more important.

Your Company's answer to higher overburdens and a faster and cheaper method of moving dirt is the Kolbe wheel excavator and our three principal mines are equipped with these machines. The wheel excavator was conceived by your Company's president, Mr. Frank F. Kolbe, and developed by him and our engineers.

Although the machine itself is very complicated, the principle of the wheel excavator is easily understood. Material is taken off one side of the pit by a revolving wheel and moved across the pit continuously by a belt conveyor system.

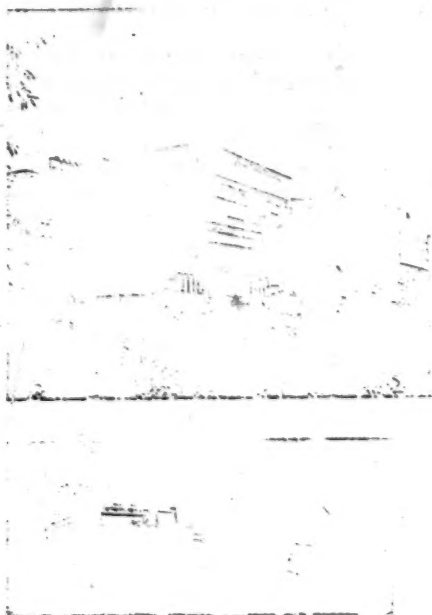
better service through improved production and marketing

more uniform control over preparation than other types and thus produce a better product. This is accomplished with less waste refuse and consequently at cost savings.

**WATER TRANSPORTATION** Transportation to the consumer is a major part of the delivered price of coal. Water movement of commodities, when practical, is considerably less expensive than other means of transportation. United Electric recognized the importance of low cost transportation of our coal and consequently were pioneers in the development of water facilities for coal in our area.

All of our principal mines are located along the Illinois or Mississippi rivers. About 50% of the coal from these mines is moved by water. We have recently invested in a barge line to further expand the markets for our coal through water transportation. We are also developing the first all-water movement of coal from Illinois mines to ports on both banks of Lake Michigan which will provide an additional outlet for our coal during the summer months. This is being accomplished by means of a barge to boat transfer operation.

These developments and improvements have been pursued to strengthen our position in the coal industry and in the overall industry of energy and fuel.



\*\*\*

Kolbe Deposition Exhibit 4  
The United Electric Coal Companies - 1958 Annual Report



To the Stockholders of The United Electric Coal Companies

**THE PRESIDENT'S LETTER**

During the past year American business and industry felt the impact of a general slackening in economic activity. United Electric's production in this period was off 7 per cent.

National production of coal during our fiscal year was about 420 million tons - 80 million tons less than during the previous year. The steel industry and export markets took 50 million tons less than in 1957 and this represents 63 per cent of the total decrease for the year. We serve neither of these two markets, however, and consequently that reduced demand resulted in no loss of business to your Company. Our decrease in output was limited to the effects of lower industrial production and resulting reduced power requirements by industry. Power requirements for residential use increased.

The expanding electric utility industry makes the outlook for coal very encouraging. Utilities are now the leading consumer of bituminous coal and prospects are bright for a continued strong growth in coal requirements for the generation of electric power. Utilities have about doubled their consumption of coal from 1949 to 1957. The Federal Power Commission has recently predicted that energy requirements for all utilities in the United States will double from the present time to 1970 and almost triple by 1980. The gain forecast for our area is slightly more than this.



## KOLBE DEPOSITION EXHIBIT 7

## THE UNITED ELECTRIC COAL COMPANIES

## 1961 Annual Report

\* \* \*

COAL DEPOSITS/At the year end your Company owned or controlled 122 million tons of recoverable coal deposits. This tonnage is greater than in previous years because, for the first time, we are including underground coal. The total amount that can be mined by the strip method is 86 million tons and 36 million tons are suitable for underground mining. We have confidence in the future of coal and we continue to add to our holdings when worth-while deposits are offered to us.

\* \* \*

This growth is important to the coal industry and is particularly significant for our Company. Last year one half of our total output was sold to utilities. Numerous large utility plants are under construction, or are being planned, in our area and we will benefit from that expansion.

It has been our objective to develop electric utility business to take advantage of the inherent stability and growth in that industry. This type of business enables us to invest in capital expansion with a minimum risk of excess productive capacity. In supplying this expanding demand for our product we avoid the serious price fluctuations which occur in widely varying and cyclical markets.

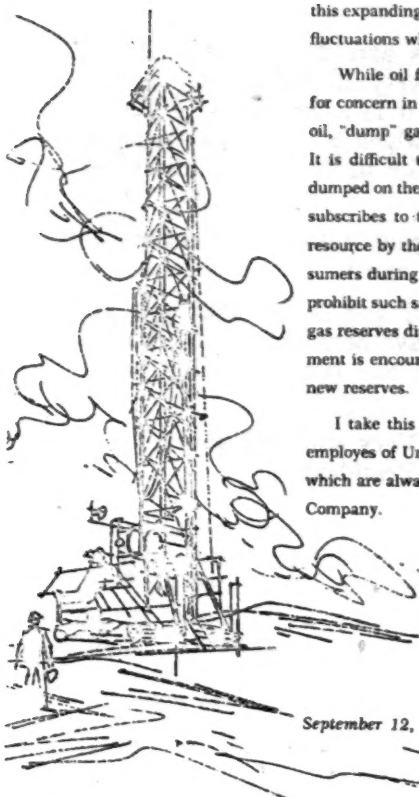
While oil for utility and industrial consumers is not a cause for concern in our market area, as our prices are below those for oil, "dump" gas does pose a serious problem for our Company. It is difficult to compete with the by-product price of this gas dumped on the market during the summer months. The Company subscribes to the view that it is a waste of a valuable natural resource by the gas industry to sell below cost to industrial consumers during the summer period and has favored legislation to prohibit such sales. We also feel it is inconsistent to have existing gas reserves dissipated in this manner when our Federal Government is encouraging with favorable tax laws the exploration for new reserves.

I take this occasion to express my sincere thanks to all the employees of United Electric for their continuing and loyal efforts which are always so important in determining the success of the Company.

Respectfully submitted,

*Frank F. Holbe*  
President

September 12, 1958



KOLBE DEPOSITION EXHIBIT 12

February 27, 1957

Mr. W. B. Hillery  
Greenwood Cut Stone Co.  
Box 54  
Greenwood, Arkansas

Dear Mr. Hillery:

We have gone over the maps and drill records of the Central Coal and Coke property in Sebastian County, Arkansas. I think that since it is a completely different type of market from that in which we are now engaged, it is too far out of our line for us to become interested at the present time.

Thank you, though, for bringing it to our attention, as it apparently has considerable merit.

It was nice to hear from you and to see that you are keeping yourself busy. We have been doing well, but at the moment the coal demand has been softening somewhat.

Very sincerely yours,  
President

Copy to: Mr. R. J. Hepburn  
Mr. T. H. Latimer

## KOLBE DEPOSITION EXHIBIT 13

February 18th  
1957

Mr. F. F. Kolbe:

I have gone over the maps and drill records of the Central Coal & Coke property in Sebastian County, Arkansas. This was submitted through W. B. Hillery.

This is but a few miles northeast of our Pine Mountain, Oklahoma field, and lies partly under Potoau Mountain, which you may remember seeing just east of Potoau, and partly under Sugarloaf Mountain. It is on the Rock Island Railroad, adjoining the town of Hartford, Arkansas.

This coal outcrops near the base of the mountain, apparently at an altitude of about 750 feet. There is apparently a small amount of stripping around the crop, but the coal dips under the mountain, and then flattens out. The drill records have no elevations on them, so I cannot determine the pitch, said to be 10%.

Analysis of the coal (Hartshorne seam) is given below.

Moisture	.81%
Volatile Matter	18.50
Fixed Carbon	74.48
Ash	6.31
Sulphur	.79
BTU	14,691

According to Central Coal and Coke, the thickness is about four foot, and the roof is good.

The drill records do not quite bear out the four foot thickness, and quite a number of check holes should be put down. These would run from 25 feet to perhaps 1300 feet in depth.

They own over 12,000 acres of mineral rights, and almost as much surface, and show over 85,000,000 tons in place.

This is an excellent grade of coal, and apparently is suitable for the type of coke the Western steel mills need badly, it is strictly an underground mining proposition, and I do not know how well it will lend itself to mechani-

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**KOLBE DEPOSITION EXHIBIT 14**

**THE UNITED ELECTRIC COAL COMPANIES**  
307 North Michigan Avenue

Chicago 1, Illinois

**FRANK F. KOLBE**  
President

August 18, 1958

**Mr. Frank Nugent, President**  
Freeman Coal Mining Corporation  
300 West Washington Street  
Chicago 6, Illinois

Dear Frank:

Herewith copies of the various letters that I received back in 1943 and 1944 relative to our dividend policy. I am also enclosing a transcript of our 1943 stockholders' meeting. Although this report is an extra copy, I would appreciate receiving it back.

Very sincerely yours,

✓s/ **Frank**  
President

**Enclosures**

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zation. If we are interested, I feel we should have it examined by a competent consultant. There is an old mine on the property, and I understand the coal can still be examined at the face. The present operation is strictly scavanging.

/s/ T. H. L.  
T. H. LATIMER

THL/ah

cc: Mr. R. J. Hepburn



## KOLBE DEPOSITION EXHIBIT 15

August 20, 1958

Mr. Frank F. Kolbe, President  
The United Electric Coal Companies  
307 North Michigan Avenue  
Chicago 1, Illinois

Dear Frank:

I am returning the letters which you received from your stockholders in 1943 and 1944, as well as a transcript of your 1943 stockholders meeting.

I gather that you have not had any letters of this nature since that time and I presume it's for the reason that you have been able to keep your stockholders happy in the intervening period.

I am grateful for the opportunity of reading this material.

Yours very truly,  
FREEMAN COAL MINING  
CORPORATION

FRANK NUGENT  
President

FN:mc

Enclosures

KOLBE DEPOSITION EXHIBIT 16

THE UNITED ELECTRIC COAL COMPANIES

307 North Michigan Avenue  
Chicago 1, Illinois

FRANK F. KOLBE  
President

January 22, 1959

Mr. Frank Nugent, President  
Freeman Coal Mining Corporation  
300 West Washington Street  
Chicago 6, Illinois

Dear Frank:

Herewith a schedule of the amount earned by various coal companies in this section. It shows that we are not getting rich at present prices.

Very sincerely yours,

/s/ Frank  
President

Enclosure

Percentage Earned on Assets—Various Coal Companies  
Calendar Year 1937

	Net Profit After Taxes			Excluding Interest Expense				
	Tons Produced	Per Ton Produced	Amount	Total Assets	Percentage Earned On Assets	Interest On Long Term Debt 1937	Estimated Net Profit	% Earned On Assets
Avonshire Collieries Corporation	8,748,519	56.76	\$ 2,919,568	\$ 48,999,000 (1)	6.1%	\$ 254,000	\$ 3,064,568	6.3%
Old Ben Coal Corporation	8,519,264	46.4	1,429,581	59,192,998	4.7	—	1,429,581	4.7
Peabody Coal Company	25,073,488	57.8	8,672,916 (2)	194,517,000	6.5	2,153,397	16,154,015 (3)	7.8
United Electric Coal Companies	8,867,753	48.5	1,876,718	20,949,000	9.0	—	1,876,718	9.0
Total—above	50,219,588	41.16	\$14,899,615	\$239,519,000	6.1%		\$18,889,899	7.3%
Trans-Texas Coal Company	7,769,354	57.66	\$ 2,918,484 (3)	\$ 46,000,000 (1)	6.3%	166,000	\$ 3,084,484 (3)	7.1%
West Kentucky Coal Company	7,724,999	15.3	1,022,577	50,273,000	2.0	396,344	1,364,996	5.1
Ziegler Coal & Coke Co.			573,698	12,494,000	8.6	111,409	475,156	5.5
			\$ 4,350,464	\$195,767,000	4.1%		\$ 5,082,546	4.8%
Total all above coal companies			\$19,210,077	\$256,026,000	5.7%		\$21,699,076	6.4%
								</

Net Profit  
(Excl. Interest)  
Per Ton  
Produced

First four companies listed

as above  
First four companies earnings  
after taxes. 19¢ a ton more  
First four companies earning  
after taxes. 39¢ a ton more  
First four companies earning  
after taxes. 19¢ on assets

(1) Assets estimated as of 12-31-37

(2) Income does not include special credit of \$939,048—principally gain  
on sale of land

(3) Income for year ended 1-31-38

January 22, 1959

The 500 largest industrial corporations in the United States earned 9.2% on their assets in 1955, 6.2% in 1956 and 7.8% in 1957. About one-fourth of these 500 corporations earned 10% or more on their assets.

As indicated on the attached schedule Ayrshire Collieries, Old Ben, Peabody, and United Electric earned as a group 6.5% on assets in 1957. If sales realization had been about 15¢ a ton higher, which would have increased profit after taxes 10¢ a ton, those companies would have earned 9% on assets—about the average of the 500 largest corporations. If it is assumed that the four coal companies should earn 10% on assets, the before tax income would have to be increased by 35¢ to 40¢ a ton by either higher realization or lower costs.

Some of the coal companies have substantial interest charges on long term debt. In order to make all companies comparable this is eliminated in the last column and an appropriate adjustment is made in taxes. If it is assumed that the above four coal companies should earn before interest charges but after taxes an amount equal to 10% of assets, the 1957 income before taxes would have to be increased by about 25¢ a ton.

## KOLBE DEPOSITION EXHIBIT 17

November 21st  
1957

Mr. F. F. Kolbe

RE: Number 5 Coal in North Canton Field  
(Specifically, an area  $1\frac{1}{2}$  miles north of Canton, west to  
Fiatt, north to Fairview, thence northeast to Farming-  
ton, south to  $1\frac{1}{2}$  miles north of Canton.)

---

Figures are based on information received from the  
Illinois State Geological Survey.

This area has been very sparsely drilled and there is  
a possibility of some faults in this area which are un-  
known in extent. However, with what information is  
available, it appears the coal dips 60 feet from Fairview  
to Brereton, a distance of 8 miles. There is a similar dip  
from the Truax-Traer property, which is approximately  
6 miles.

Using this information, I feel there is possibly 10,000  
acres of coal with less than 100 feet of overburden, or  
50,000,000 tons of coal in this area northwest of Canton.  
In this same field, there should be another 50,000,000  
tons of coal with 100 to 170 feet of cover. *The above  
acreage consists of the best farm land in Fulton County.*

It should be noted here, that in the area between Can-  
ton and Glasford, there is possibly 6,000 acres of coal  
with less than 100 feet of cover. This area has not been  
drilled either.

Attached is a small map showing the relative position  
of properties and overburden contours.

/s/ R. H. I.  
R. H. INMAN

RHI/ah

cc: Mr. R. J. Hepburn  
Mr. T. H. Latimer

## KOLBE DEPOSITION EXHIBIT 33

May 10th  
1961

Mr. R. J. Hepburn

## INDUSTRY FIELD

We have examined our drill records at Industry and have compiled the average overburden.

The study was confined mainly to what is our present area and 80' was the maximum overburden. I then went back over the field and made an estimate of the reserves under 65' excluding all over 65' except that which I feel is necessary to mine for accessibility.

The entire field has a reserve of 16,810,000 tons with an average ratio of 27.4.

Excluding that area with over 65' of overburden not necessary to mine, the field reserves are 14,300,000 tons with a ratio of 26.2. This is an average overburden of 52.4'. Using averages only, the following is a typical drill hole.

	Percent	Feet
Surface	41.1	21.5
Gray Shale	25.5	13.4
Sandy Shale	25.6	13.4
Sand Rock	6.1	3.2
Sand	1.2	0.6
Mud	0.5	0.3

In looking over the drilling we have numerous holes which do not have any sandrock, but there are some with 3.0' to 35' of sandrock; where this does not appear we have sandy shale. I feel any future study should include core samples of this sandy shale.

I tentatively pick a spot of no coal area south and east of the center of the field for possible tippie location. This location would have an average haul of  $1\frac{3}{4}$  miles.



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Enclosed is a breakdown by sections of the coal reserves and the haul distance from above mentioned tipple location. Also enclosed are the drill logs per quarter section.

/s/ R. H. I.  
R. H. INMAN

RHI/ah

INDUSTRY FIELD  
Estimate Of Tons By Section

Section	Acres	Total Coal Acres	Acres Under 65'	Total Tons Under 80'	Controlled Tons	Total Tons Under 65'	Ratio Under 65'	Haulage Miles
22	640	271	271	852,176	556,168	852,176	21.3	2.5
23	640	50	50	168,440	168,440	168,440	21.4	2.0
24	640	119	119	378,557	231,400	378,557	21.2	2.0
19	640	282	282	870,384	30,000	870,384	26.3	2.9
20	640	80	80	255,000	0	255,000	27.9	3.2
29	640	270	0	862,400	0	0	0	—
30	640	421	322	1,418,264	850,320	1,084,733	23.5	2.2
25	640	630	630	2,104,920	2,074,920	2,104,920	27.1	1.6
26	640	474	474	1,560,038	1,560,038	1,560,038	26.3	1.6
27	640	101	101	316,736	316,736	316,736	20.5	2.3
28	640	60	60	192,000	192,000	192,000	22.9	2.5
32	640	90	90	288,000	0	288,000	26.3	3.3
33	640	482	442	1,520,610	760,305	1,394,410	26.3	2.6
34	640	425	267	1,370,600	628,375	861,050	23.7	1.5
35	640	445	445	1,466,046	1,196,546	1,466,046	29.1	0.7
36	640	340	340	1,086,419	811,530	1,086,419	25.0	0.7
2	640	278	183	854,640	854,640	562,610	24.3	0.7
3	640	530	73	470,400	0	228,928	31.3	1.3
4	640	240	203	773,280	282,240	654,066	25.8	2.7
				<u>16,908,910</u>	<u>10,514,158</u>	<u>14,324,000</u>	<u>Ave. 26.2</u>	<u>Ave. 1.75</u>

Kolbe Dep E42-1d



1939

ANNUAL REPORT

The United Electric  
Coal Companies

CHICAGO

YEAR ENDED JULY 31st 1939

## PRESIDENT'S REPORT

To the Stockholders of

THE UNITED ELECTRIC COAL COMPANIES:

The annual report of The United Electric Coal Companies is submitted herewith.

Notwithstanding the depressed business conditions during the year ended July 31, 1939, your Company produced 2,078,696 tons of coal, an increase of 13 per cent above the production of 1,838,656 tons for the preceding twelve months. Total production of bituminous coal in the United States during the same period was 358,708,000 tons, compared with 361,559,000 tons for the twelve months ended July 31, 1938, a decrease of  $3/4$  of 1 per cent. The production of 2,078,696 tons of coal during the last fiscal year was the largest production in the history of The United Electric Coal Companies, the best previous year being 1930 when production was 1,897,319 tons.

The net income for the year ended July 31, 1939 was \$167,196.98, (before deducting write off on contracts acquired in 1929, now expired or abandoned, \$146,240.57) as compared with \$226,795.10 for the previous year. This decrease in net income is due to a reduction of 10 cents a ton in the selling price of our coal, partially offset by a reduction of 6 cents a ton in operating cost.

The average wage rate per hour paid to its mine labor by The United Electric Coal Companies in the year ended July 31, 1939, was 93.0 cents as against an average of 92.5 cents for the bituminous coal industry in the State of Illinois. This compares with 68.5 cents, the average wage of all industry in the State of Illinois, also with 92.6 cents for the average wage in the automobile industry and 64.6 cents for all manufacturing industries in the United States.

During the year, the Company operated four mines with the following production in tons:

Fidelity.....	992,026
Freeburg.....	244,614
Cuba.....	271,250
Buckheart.....	570,806

All mines are in excellent physical shape and are well equipped to take advantage of any increase in sales. The Buckheart Mine continues as one of the lowest cost producers in the United States, and it has the further advantage that its production is now moving to new markets through the completion last November of the 8-mile railroad to our loading terminal on the Illinois River.

The total reserves of coal owned or controlled by the Company are estimated at 65 million tons, divided among the different mines as follows:

Fidelity.....	24,288,983 tons
Freeburg.....	2,225,655 tons
Cuba.....	2,959,718 tons
Buckheart.....	11,079,896 tons
Other properties.....	24,766,017 tons

These reserves may be further increased through purchase or lease of additional areas adjacent to each of the above mines.

In October of last year, in accordance with plans previously submitted to stockholders, \$2,100,000 was borrowed from banks. With the proceeds the old Creditors' Agreement notes were paid in full, all outstanding equipment notes were redeemed, and the balance was used in building the railroad to Liverpool, and to increase the Company's working capital. As of September 16, 1939, this debt had been reduced to \$1,708,523.51.

The officers of the Company, together with the officers of other coal companies throughout the United States, have devoted considerable time and effort to the work of establishing minimum prices under the provisions of the Guffey Act. There is, however, nothing definite to be reported to the stockholders at this time.

Since the close of the last fiscal year, your Company has cooperated in the formation of two marketing agencies, one in the Fulton-Peoria District, where the Buckheart and Cuba mines are located, and the other in the Belleville District which includes the Fidelity and Freeburg mines. It is expected that these agencies, to which most of the strip mine operators in these areas belong, will do away with some of the unfavorable conditions that have existed in the past. These organizations are sanctioned by the Guffey Act.

Respectfully submitted,  
FRANK F. KOLBE,  
President.

September 16, 1939.

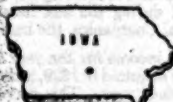
## Kolbe Deposition Exhibit 51

The United Electric Coal Companies - 1948 Annual Report

\* \* \*

\* OFFICES: CHICAGO ST. LOUIS PEORIA DES MOINES

\* MINES: FIDELITY MINE, DuQuoin, Illinois    BUCKHEART MINE, Canton, Illinois    CURA MINE, Cuba, Illinois  
 RED RAY MINE, Freeburg, Illinois    SOLAR MINE, Belleville, Illinois    BUFFALO CREEK MINE, St. Charles, Ky.



## A TEN YEAR RECORD OF GROWTH IN SERVICE

Even though you have an unusual interest in coal, it may never have occurred to you that, with the exception of food and water, coal is perhaps the most important and vital product known to man and is our greatest and most dependable source of useful energy.

Our economy is designed to function on power. In a handful of coal weighing less than a pound there is enough power to raise a weight of 33,000 pounds sixty feet. All the potential power of our reserves of oil and natural gas and of the water in our dams combined is only a

\* \* \*

Kolbe Deposition Exhibit 57

## The United Electric Coal Companies - 1954 Annual Report

• • •

During the last two years we expended \$3,094,165 for plant and equipment and \$808,388 for lands. We have paid for these improvements with earnings and \$735,278 of the proceeds of bank loans made in November, 1952. The remaining portion of these bank loans of \$1,540,000 has been added to our working capital resulting in a net increase in working capital for the two years of \$804,722.

**PRODUCTION AND CONSUMPTION** Last year was a period of considerable readjustment in the coal industry. Production for the country as a whole during our fiscal year was 404,000,000 tons, a decrease of 12% from the year before. The national production has been on the down trend for several years from its peak of 630,000,000 tons in 1947. In that year the railroad demand was 113,000,000 tons, and during our last fiscal year it was 21,000,000 tons. Residential consumption has also decreased from 59,000,000 to 39,000,000 tons in the same period. The decrease in railroad and residential business probably constitutes a permanent loss.

The bright feature in the coal industry has been the great increase in the coal used by the utilities. In 1940 this was 49,000,000 tons, and in our 1954 fiscal year it was 113,000,000. Thirty-six percent of our business is now with utilities and this percentage will increase.

**Consumption of coal by various classes of customers during the past ten years**

[illegible]





**VALUATION**  
**OF**  
**PHYSICAL ASSETS**  
**UNITED ELECTRIC COAL COMPANIES**  
**AS OF**  
**DECEMBER 31, 1959**



**PAUL WEIR COMPANY**

**MINING ENGINEERS**

**20 NORTH WACKER DRIVE**

**CHICAGO, ILLINOIS 60606**

**PAUL WEIR COMPANY**

INCORPORATED

MINING ENGINEERS AND GEOLOGISTS  
DESIGN AND CONSTRUCTION

PAUL WEIR, CHAIRMAN OF THE BOARD  
CLAYTON G. BALL, PRESIDENT  
JOHN E. GOOD, VICE PRESIDENT  
JOHN F. WEIR, VICE PRESIDENT  
EDWIN GAMMETER, VICE PRESIDENT  
GEORGE S. BELLON, VICE PRESIDENT  
JOHN A. BENTON, CHIEF ENGINEER

FINANCIAL 6-0278  
1-20 NORTH WENTWORTH AVE.  
CHICAGO 6, ILLINOIS

July 25, 1960

United Electric Coal Companies  
307 North Michigan Avenue  
Chicago 1, Illinois

Attention: Mr. J. N. Morris, President

Dear Sir:

You have requested us to give you an opinion of the value as of December 31, 1959 of the physical assets owned by your corporation. Accordingly, we have made the studies deemed by us to be necessary to give you such an opinion.

Insofar as possible, our findings are presented in Exhibits A to G, inclusive. The text of the report is at a minimum. Our findings are related to the book values of the physical assets as shown on your December 31, 1959 balance sheet. There are several considerations to which we direct your attention.

The principal factor we use in arriving at an opinion of the value of an individual active mine as an operating entity is the anticipated amount of cash generation that may be reasonably expected to accrue during the remaining life of the recoverable coal reserves available to the mine. Obviously, no value except that of salvage attaches to a mine operating at an out-of-pocket loss.

The estimation of the amount of cash generation for each year of remaining life of the mine involves the estimation of sales realizations, of total costs, and of the amount of federal income tax on profits, if any, calculated without any deductions for interest. Obviously, value is a factor independent of the means employed in financing. It also involves the estimation of additional investment necessary for replacement equipment and sometimes for additional equipment and/or additional coal reserves.

The estimation of future profits after federal income tax involves an analysis of past profits and the conditions under which profits accrued. Future profits must reflect anticipated changes in overburden ratios and other conditions that affect sales volume, total costs and sales realization.

Very Respectfully,  
Paul Weir

July 25, 1960

The value of an operating mine when based on cash generation includes its proportional share of the value of all company-owned facilities at head and branch offices such as automobiles, furniture and fixtures that do not in themselves produce an operating profit. Excluded only are those items such as the recently acquired steel barges, farm buildings and equipment, Kingston River Terminal and inactive coal reserves. The profit-producing potential of the steel barges is unknown. Farm buildings and equipment are not profit-producing. Income from Kingston River Terminal is nominal.

The value that we assign to property, plant and equipment at an active mine represents that amount in dollars as of December 31, 1959 on which, out of the estimated net cash generation at the end of each year, there will be available an amount which is sufficient to provide a return of 10 percent on the amortized value at the end of each year and leave a remainder which, if applied to reduce the value, will extinguish it during the life of the mine.

We point out that when and if 10 to 12 percent of the sales realization from an individual mine is recovered as a profit after federal income tax without considering any deductions for interest, the operating results are invariably satisfactory. Above this zone of 10 to 12 percent, the operating results are very satisfactory. Below this zone of 10 to 12 percent, the mine is probably marginal.

We also point out that approximately 50 percent of the total values are represented by active mines. The value of inactive coal reserves alone represents approximately 3 percent of the total value.

Appended to this report are Exhibits A to C, inclusive. These present details of the compilation of our values. We make these specific comments:

#### Exhibit A - Buckheart

This includes the railroad and dock installation. The cash generation pattern is well established. The operation is exceedingly profitable.

#### Exhibit B - Cuba

The cash generation pattern has been changed to a minor extent by the installation of a Kolbe Wheel in mid 1959. For our purpose we have assumed that \$1,000,000 remains in the capital account six years hence, also that the salvage value of equipment other than the wheel will be \$300,000. This mine is a profitable operation.

United Electric Coal Companies - 3 -

July 25, 1960

Exhibit C - Fidelity

This operation has been and continues to be a marginal one. Our value of \$3,463,939 is less than the book value of \$3,698,321. While the earnings record does not support the book value, we believe that the property could be sold for the book value.

Exhibit D - Mary Moore

The coal reserves at this mine will be completely depleted during September 1960. Our value reflects cash generation for nine months plus a salvage value, the chief part of which is concentrated in the 7400 draglines.

Exhibit E - Banner

There is no earnings record on which to project values. We recognize that the inherent quality of the coal moves it into a higher price bracket than that of Fulton County coal. However, the coal seam is thin and stripping ratio is high. There are certain to be some unanticipated problems. We believe that our value, which represents a write-up of approximately \$1,700,000, is a reasonable expectation.

Exhibit F

This is a summary of values assigned to the physical assets.

Exhibit G

This represents the Inactive Coal Reserves. Our opinion is that the present value of these coal reserves is that shown as the book value. Our procedure on active mines has been based on an after-tax return of 10 percent. It is unlikely that there will be any substantial amount of depletion of these reserves during the next decade. On a 10 percent compound basis, the investment in the reserves may be said to be \$4,961,450 ten years hence. We do not believe the present book value is excessive. At the same time, we see no logical basis for any write-up in value.

The North Canton and Industry Fields will have substantially higher stripping ratios. In time, competitive conditions will permit their profitable development.

Advance Royalties

The December 31, 1959 balance sheet shows the amount of advance royalties to be \$687,554. Almost 90 percent of this is charged to Buckheart and Banner Mines. While this item is not a "physical asset" we do comment that we believe the asset is sound.

United Electric Coal Companies

- 4 -

July 25, 1960

General

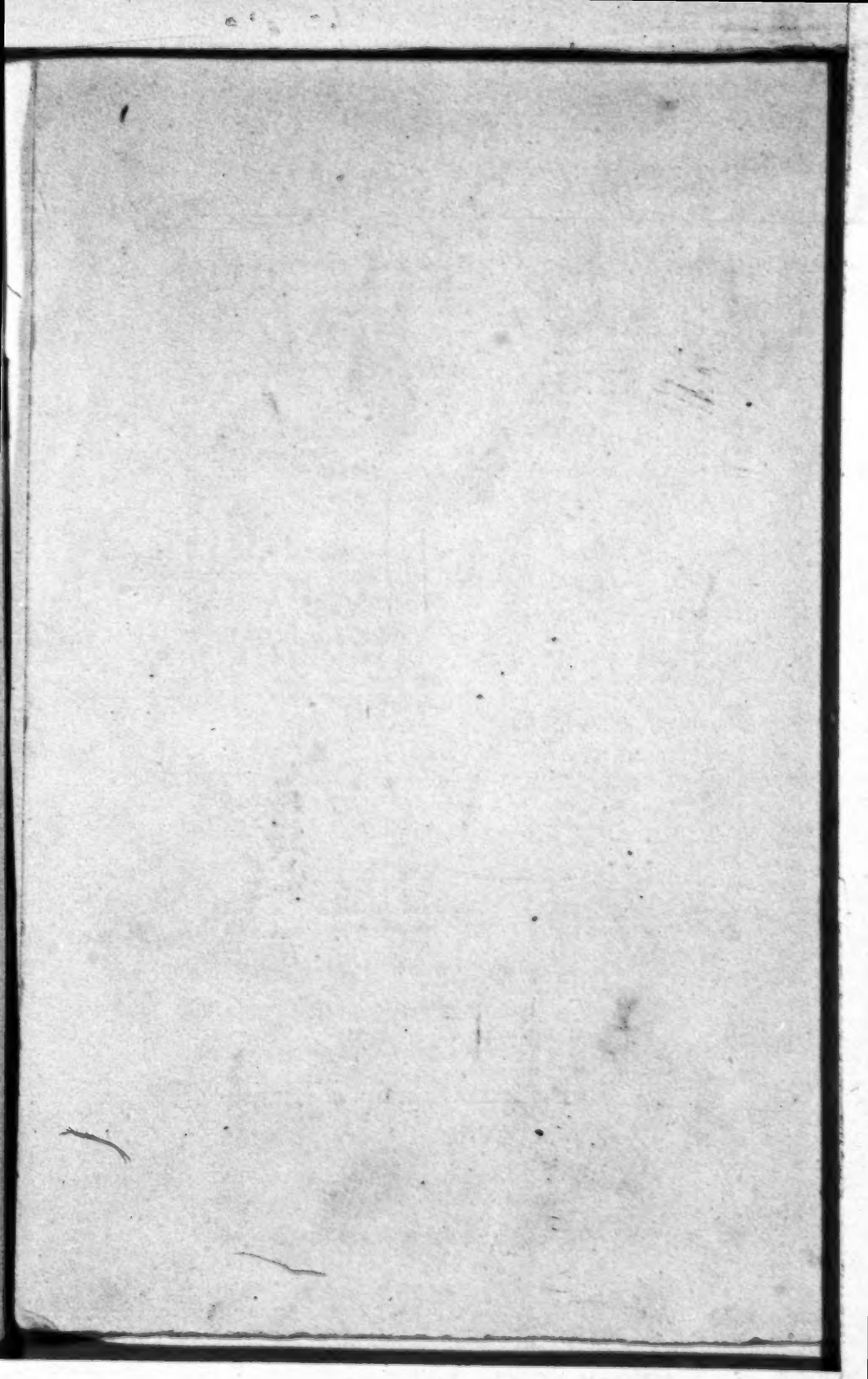
We have made exhaustive checks on estimates of recoverable coal reserves. We believe the estimates prepared by the Company are accurate. We have checked the anticipated future stripping ratios. Some increases are indicated but we do not believe that the increases will have more than a nominal effect on our projections and then only during the late years when the present worth factor is low.

We have made careful checks on plant and equipment. In our opinion, operating results represent a reasonable expectancy from the equipment in use.

Our value of \$23,446,225 as of December 31, 1959 exceeds the book value of \$16,902,703 of that same date by \$6,543,522. The amount of \$16,902,703 is the sum of \$16,321,169 and \$581,534, the amount actually paid on option contracts. If this excess were added to the shareholders' equity as of that date, the total would have been \$26,669,388.

Respectfully submitted,

PwL





**EXHIBIT A**  
**VALUATION DATA**  
**BUCKEYE RAILROAD AND RIVER TERMINAL**

	Fiscal Years ending July 31st					Average for 5 Years	Fiscal Year ending 7/31/59	Five Months ending December 31st		Projection for 17 Years	
	1954	1955	1956	1957	1958			1958	1959	Amount	Per Ton
A. Production in Tons	900,360	1,077,608	1,142,775	1,206,885	1,097,508	1,085,027	1,250,479	562,680	583,072	22,067,152	1,298,067
B. Total Cost of Production, Sales & Administration	Per Ton	Per Ton	Per Ton	Per Ton	Per Ton	Per Ton	Per Ton	Per Ton	Per Ton		
1. All costs other than	\$2.7433	\$2.8920	\$3.0235	\$2.8889	\$3.1769	\$2.9520	\$3.0509	\$2.8775	\$3.0285	\$67,304,814	\$3.0500
2. Royalty	0.0070	-	-	-	0.0076	0.0027	0.0058	0.0037	0.0933	1,313,924(a)	0.0595
3. Depreciation	0.2684	0.2838	0.2921	0.2721	0.2880	0.2812	0.2857	0.2752	0.3232	5,031,516(c)	0.2280
4. Sustained Depletion	0.0609	0.0591	0.0633	0.1493	0.1520	0.0991	0.1567	0.1606	0.0581	2,220,410(b)	0.1106
Total	3.0796	3.2349	3.3789	3.3103	3.6245	3.3350	3.4991	3.3170	3.5032	75,870,764	3.4381
C. Net Sales Realization	3.9939	3.9539	4.0966	4.3413	4.4177	4.1706	4.4509	4.4238	4.5460	99,964,199	4.5300
D. Total Cost	3.0796	3.2349	3.3789	3.3103	3.6245	3.3350	3.4991	3.3170	3.5032	75,870,764	3.4381
E. Pre Tax Profit	0.9143	0.7190	0.7177	1.0310	0.7932	0.8356	0.9518	1.1068	1.0428	24,093,435	1.0919
F. Federal Income Tax	0.2937	0.1972	0.1983	0.3834	0.2572	0.2670	0.3408	0.4249	0.3370	8,459,937	0.3834
G. Net Profit after FIT ADD:	0.6206	0.5218	0.5194	0.6476	0.5360	0.5686	0.6111	0.6819	0.7058	15,633,498	0.7085
H-3 Depreciation	0.2684	0.2838	0.2921	0.2721	0.2880	0.2812	0.2857	0.2752	0.3232	5,031,516	0.2280
H-4 Sustained Depletion	0.0609	0.0591	0.0633	0.1493	0.1520	0.0991	0.1567	0.1606	0.0581	2,220,410	0.1106
I. Gross Cash Generation	\$0.9499	\$0.8647	\$0.8743	\$1.0650	\$0.9760	\$0.9489	\$1.0532	\$1.1177	\$1.0871	\$22,885,424	\$1.0371
	(\$355,247)	(\$931,821)	(\$999,789)	(\$1,290,142)	(\$1,071,228)	(\$1,029,645)	(\$1,317,128)	(\$628,791)	(\$633,864)		
H. Book Values, in \$:											
1. Coal Lands	\$1,376,002	\$3,041,285	\$3,026,199	\$2,935,897	\$2,772,527	\$2,630,382	\$2,696,395		\$2,220,410		
2. Plant & Equipment	2,579,660	2,459,460	2,360,432	2,617,702	2,917,514	2,586,954	2,921,011		2,758,233		
3. Work in Progress	-	-	-	-	-	-	-		-		
Total	\$3,955,662	\$5,500,745	\$5,386,631	\$5,553,599	\$5,690,041	\$5,217,336	\$5,617,406		\$4,978,643		
I. Net Profit after FIT as Percent of:											
1. Net Sales Realization	15.54	13.20	12.68	14.94	12.13	13.63	13.73	15.41	14.48	15.64	
2. Total Book Value	14.13	10.22	11.02	14.07	10.34	11.82	13.60				
J. Gross Cash Generation as Percent of:											
1. Net Sales Realization	23.78	21.87	21.36	24.62	22.09	22.75	23.67	25.27	23.91	22.89	
2. Total Book Value	21.62	16.94	18.56	23.23	18.83	19.73	23.45				

## FOOT NOTES:

Basis for Projection for 17 Years:

- (a) Royalty: 6,569,618 tons @ \$0.20 per ton \$1,313,924  
 (c) Fee: 15,497,534 tons, Book Value \$2,220,410  
 (b) Necessary Reinvestment estimated at  
 \$0.12 per ton for 14 years \$2,180,753  
 \$2,180,753 plus \$2,850,763 is total  
 to be depreciated.  
 Assumed cost of Working Capital is  
 1.25 percent of Sales Realization.

Estimated Salvage Value 17 years hence \$ 500,000

COMPARISON OF VALUES  
PERIOD

	First 14 Years		Last 3 Years		Total, 17 Years	
Production in Tons	18,172,940		3,894,212		22,067,152	
Estimated Gross Cash Generation	\$18,846,819	\$1.0371	\$4,038,605	\$1.0371	\$22,885,424	\$1.0371
Less cost of working capital	1,029,042	0.0566	220,510	0.0566	1,249,552	0.0566
	17,817,777	0.9805	3,818,095	0.9805	21,635,872	0.9805
Less Reinvestment	2,180,753	0.1200	-	-	2,180,753	0.0988
Net Cash Generation	\$15,637,024	\$0.8605	\$3,818,095	\$0.9805	\$19,455,119	\$0.8817
Present Worth Factors	0.52619		0.82895		0.26333	
Present Worth as of 12/31/1959	\$ 8,228,046		\$ 833,442		\$ 9,061,488	
at 10 percent discount						
Add present worth of Salvage Value					98,925	
Total Value as of December 31, 1959					\$ 9,160,413	
Value per ton of Annual Production					\$7.06	



**EXHIBIT B**  
**VALUATION DATA**  
**CURA MINE**

	Fiscal Years ending July 31st					Average for 5 Years	Fiscal Year ending 7/31/59	Five Months ending December 31st		Projection for 6 Years	
	1954	1955	1956	1957	1958			1958	1959	Amount	Per Ton
A. Production in Tons	838,086	761,613	800,558	766,466	794,367	792,218	847,492	324,439	380,595	4,502,153	(750,359)
B. Total Cost of Production, Sales & Administration:	Per Ton	Per Ton	Per Ton	Per Ton	Per Ton	Per Ton	Per Ton	Per Ton	Per Ton		
1. All costs other than	\$2.7847	\$3.0237	\$2.6492	\$3.0821	\$3.0619	\$2.9164	\$3.0975	\$3.0292	\$3.0144	\$13,551,481	\$3.0100
2. Royalty	-	0.0029	0.0401	0.0454	0.0159	0.0206	0.0248	0.0216	0.0297	391(a)	-
3. Depreciation	0.1696	0.1864	0.1866	0.2224	0.2467	0.2020	0.2954	0.2292	0.3629	1,857,084(c)	0.4125
4. Sustained Depletion	0.0746	0.0747	0.0585	0.0564	0.0504	0.0660	0.0456	0.0481	0.0452	300,830(b)	0.0668
Total	3.0289	3.2877	2.9344	3.4063	3.3899	3.2050	3.4632	3.3281	3.4522	15,709,786	3.4893
C. Net Sales Realization	3.8573	3.7742	3.9645	4.2236	4.3190	4.0264	4.2974	4.2601	4.2451	19,314,236	4.2900
D. Total Cost	3.0289	3.2877	2.9344	3.4063	3.3899	3.2050	3.4632	3.3281	3.4522	15,709,786	3.4893
E. Pre Tax Profit	0.8284	0.4865	1.0301	0.8173	0.9291	0.8214	0.8342	0.9320	0.7929	3,604,450	0.8007
F. Federal Income Tax	0.2624	0.1382	0.3551	0.2292	0.2865	0.2560	0.2228	0.2826	0.2123	993,405	0.2207
G. Net Profit after FIT AND:	0.5660	0.3478	0.6750	0.5874	0.6426	0.5654	0.6054	0.6494	0.5806	2,611,045	0.5800
H-3 Depreciation	0.1696	0.1864	0.1866	0.2224	0.2467	0.2020	0.2754	0.2292	0.3629	1,857,084	0.4125
H-4 Sustained Depletion	0.0746	0.0747	0.0585	0.0564	0.0504	0.0660	0.0456	0.0481	0.0452	300,830	0.0668
I. Gross Cash Generation	\$0.8102	\$0.6089	\$0.9201	\$0.8662	\$0.9547	\$0.8334	\$0.5464	\$0.9267	\$0.9887	\$4,768,959	\$1.0593
	(\$678,980)	(\$463,821)	(\$736,579)	(\$663,938)	(\$758,428)	(\$660,349)	(\$802,017)				
H. Book Values, in \$:											
1. Coal Lands	\$534,543	\$483,163	\$444,326	\$407,712	\$357,705	\$445,492	\$315,044		\$300,830		
Plant & Equipment	1,085,609	968,137	1,060,046	1,001,361	993,024	1,021,635	2,716,259		2,548,415		
Work in Progress	26,957(d)	19,345(d)	11,321(d)	402,824(e)	1,255,182	383,166					
Total	\$1,647,109	\$1,470,645	\$1,515,693	\$1,811,897	\$2,606,111	\$1,810,293	\$3,031,353		\$2,849,245		
I. Net Profit after FIT as percent of:											
1. Net Sales Realization	14.67	9.22	17.02	15.72	14.88	14.04	14.09	15.24	13.68	13.52	
2. Total Book Value	28.80	18.01	35.65	28.55	16.75	24.74	16.91		18.62		
J. Gross Cash Generation as percent of:											
1. Net Sales Realization	21.00	16.14	23.21	17.86	22.10	20.70	22.02	21.75	23.29	24.69	
2. Total Book Value	41.22	31.54	48.60	38.92	24.88	36.47	26.43		31.70		

**FOOT NOTES:**

Basis for Projection for 6 Years:

- (a) Royalty: 391 tons @ \$0.15 per ton \$ 59  
 (c) Fee: 4,501,762 tons, Book Value \$300,830  
 (b) Necessary Reinvestment estimated  
 at \$0.12 per ton for 3 years \$270,129  
 \$270,129 plus \$1,586,955(f) is  
 total amount to be depreciated.  
 Assumed cost of Working Capital is  
 1.25 percent of Sales Realization.  
 Estimated Salvage Value 6 years hence \$1,300,000  
 (d) General Development.  
 (e) Includes \$3,685 of General Development.  
 (f) Assumes that \$1,000,000 remains in Capital  
 account at end of 6 years and is added to  
 Salvage Value.

**COMPUTATION OF VALUES**

	First 3 Years		Last 3 Years		Total 6 Years	
	PERIOD		PERIOD			
Production in Tons	2,251,077		2,251,076		4,502,153	
Estimated Gross Cash Generation	(\$2,384,480)	\$1.0593	\$2,384,479	\$1.0593	\$4,768,959	\$1.0593
Less cost of Working Capital	120,714	0.0536	120,714	0.0536	241,428	0.0536
	2,263,766	1.0057	2,263,765	1.0057	4,527,531	1.0057
Less Reinvestment	270,129	0.1200	-	-	270,129	0.0601
Net Cash Generation	(\$1,993,637)	\$0.8857	\$2,263,765	\$1.0057	\$4,257,402	\$0.9456
Present Worth Factors	0.82895		0.82895			
			0.75131			
Present Worth as of 12/31/1959	(\$1,652,625)		\$1,409,869		\$3,062,494	
Add present worth of Salvage Value					733,811	
Total Value as of December 31, 1959					\$3,796,305	
Value per ton of Annual Production					\$5.06	



**EXHIBIT C**  
**VALUATION DATA**  
**PERMANENT MINE**

	Fiscal Years ending July 31st					Average for 5 Years	Fiscal Year ending 7/31/59	Five Months ending December 31st		Projection for 25 Years 29,609,062 (1,184,362)
	1954	1955	1956	1957	1958			1958	1959	
A. Production in Tons	929,740	1,067,413	1,308,779	1,327,046	1,148,951	1,156,386	1,164,176	531,241	512,612	
B. Total Cost of Production, Sales & Administration	Per Ton	Per Ton	Per Ton	Per Ton	Per Ton	Per Ton	Per Ton	Per Ton	Per Ton	Amount Per Ton
1. All costs other than	\$2.8798	\$2.6346	\$2.6363	\$2.9331	\$2.9214	\$2.7999	\$3.1877	\$2.9510	\$3.3433	\$94,748,998 \$3.2000
2. Royalty	0.0228	0.0035	0.0162	0.0063	0.0297	0.0153	0.0268	0.0331	0.0079	426,826(a) 0.0144
3. Depreciation	0.3323	0.3824	0.3731	0.3751	0.3161	0.3574	0.2473	0.2318	0.2456	5,138,025(a) 0.1735
4. Sustained Depletion	0.0530	0.0538	0.0326	0.0524	0.0358	0.0450	0.0448	0.0401	0.0542	1,804,037(b) 0.0609
Total	3.2879	3.0742	3.0582	3.3669	3.3030	3.2176	3.5066	3.2560	3.6510	102,117,886 3.4488
C. Net Sales Realization	3.4509	3.1107	3.3643	3.7115	3.7605	3.4898	3.7654	3.7462	3.8301	112,514,436 3.8000
D. Total Cost	3.2879	3.0742	3.0582	3.3669	3.3030	3.2176	3.5066	3.2560	3.6510	102,117,886 3.4488
E. Pre Tax Profit	0.1630	0.0365	0.3061	0.3446	0.4575	0.2722	0.2588	0.4902	0.1791	10,396,550 0.3512
F. Federal Income Tax	0.0502	0.0181	0.0838	0.0991	0.1235	0.0777	0.0782	0.1336	0.0564	3,034,653 0.1025
G. Net Profit after FIT	0.1128	0.0182	0.2223	0.2455	0.3340	0.1945	0.1846	0.3566	0.1227	7,361,897 0.2487
ADD:										
H-3 Depreciation	0.3323	0.3824	0.3731	0.3751	0.3161	0.3574	0.2473	0.2318	0.2456	5,138,025 0.1735
H-4 Sustained Depletion	0.0530	0.0538	0.0326	0.0524	0.0358	0.0450	0.0448	0.0401	0.0542	1,804,037 0.0609
I. Gross Cash Generation	\$0.4981	\$0.4544	\$0.6280	\$0.6750	\$0.6859	\$0.5969	\$0.4757	\$0.6285	\$0.4225	\$14,303,959 \$0.4831
((\$463,064))		(\$495,008)	(\$21,870)	(\$893,205)	(\$768,142)	(\$690,258)	(\$554,950)	(\$333,902)	(\$216,554)	
J. Book Values, in \$:										
1. Coal Lands	\$1,384,821	\$1,417,544	\$1,407,440	\$1,433,522	\$1,969,535		\$1,948,711			
2. Plant & Equipment	2,855,524	3,209,509	2,807,848	2,499,592	2,233,138		2,109,033	\$1,804,037		
3. Work in Progress	738,633(d)	2,505(e)						1,894,784		
Total	\$4,978,978	\$4,629,638	\$4,215,288	\$3,933,114	\$4,202,673	\$4,391,938	\$4,057,744	\$3,698,821		
K. Net Profit after FIT as Percent of:										
1. Net Sales Realization	3.27	0.58	6.61	4.79	8.88	5.57	4.90	9.52	3.20	6.54
2. Total Book Value	2.10	0.42	6.90	8.28	9.13	5.12	5.30		4.09	
L. Gross Cash Generation as Percent of:										
1. Net Sales Realization	14.43	14.61	18.67	18.13	18.24	17.10	12.66	19.38	11.03	12.71
2. Total Book Value	9.30	10.48	19.50	22.71	18.75	15.72	13.68		14.05	

**FOOT NOTES:**

Basis for Projection for 25 Years:

- (a) Royalty: 6,097,513 tons @ \$0.07 per ton \$ 426,826  
 (a) Fee: 23,511,549 tons, Book Value \$1,804,037  
 (b) Necessary Reinvestment estimated at  
 \$0.12 per ton for 22 years 3,126,717  
 \$3,126,717 plus \$2,011,308 is total  
 amount to be depreciated. \$5,138,025  
 Assumed cost of Working Capital is  
 1.25 percent of Sales Realization. \$1,406,430  
 Estimated Salvage Value 25 years hence \$ 300,000  
 (d) Includes leases at \$2,739 and  
 General Development at \$7,376.  
 (e) \$2,505 is Coal Leases.

	First 22 Years		COMPUTATION OF VALUES		Last 3 Years		Total, 25 Years	
	Production in Tons							
Estimated Gross Cash Generation	26,055,975	\$12,587,484	\$0.4831	\$1,716,475	\$0.4831	\$14,303,959	\$0.4831	
Less cost of Working Capital		1,237,658	0.0475	168,772	0.0475	1,406,430	0.0475	
		11,349,826	0.4356	1,547,703	0.4356	12,897,529	0.4356	
Less Reinvestment		3,126,717	0.1200			3,126,717	0.1200	
Net Cash Generation		\$8,223,109	\$0.3156	\$1,547,703	\$0.4356	\$9,770,812	\$0.3300	
Present Worth Factors		0.39871		0.12285				
at 10 percent discount				0.82895				
Present Worth as of 12/31/1959		\$3,276,636		\$ 157,613		\$3,436,249		
Add present worth of Salvage Value						27,690		
Total Value as of December 31, 1959						\$3,463,939		
Value per ton of annual production						\$2.92		



**EXHIBIT D**  
**VALUATION DATA**  
**MARY MOORE MINE**

	<u>Fiscal Years ending July 31st</u>			<u>5 Months</u> <u>Ending</u> <u>12/31/1959</u>	<u>Projection for Nine</u> <u>Months - 1960</u> <u>Calendar Year</u>	
	1957	1958	1959			
A. Production in Tons	335,532	303,304	307,301	149,569	209,199	
B. Total Cost of Production, Sales & Administration:	<u>Per Ton</u>	<u>Per Ton</u>	<u>Per Ton</u>	<u>Per Ton</u>	<u>Amount</u>	<u>Per Ton</u>
1. All costs other than B-2, B-3, B-4	\$2.7390	\$2.8316	\$2.6019	\$2.6156	543,505	\$2.5980
2. Royalty	0.1088	0.0888	0.0002	-	-	-
3. Depreciation	0.4707	0.4432	0.5246	0.3779	82,365	0.3937
4. Sustained Depletion	0.0146	0.0256	0.0762	0.0605	12,187(b)	0.0583
Total	3.3331	3.3893	3.2029	3.0540	638,057	3.0500
C. Net Sales Realization	3.9635	4.0349	4.0748	3.8835	794,956	3.8000
D. Total Cost	3.3331	3.3893	3.2029	3.0540	638,057	3.0500
E. Pre Tax Profit	0.6304	0.6456	0.8719	0.8295	156,899	0.7500
F. Federal Income Tax	0.1513	0.1564	0.2286	0.2161	36,669	0.1753
G. Net Profit after FIT	0.4791	0.4892	0.6433	0.6134	120,230	0.5747
ADD:						
B-3 Depreciation	0.4707	0.4432	0.5246	0.3779	82,365	0.3937
B-4 Sustained Depletion	0.0146	0.0256	0.0762	0.0605	12,187	0.0583
G. Gross Cash Generation	\$0.9644	\$0.9580	\$1.2441	\$1.0518	\$214,782	\$1.0267
H. Book Values, in \$:	(\$323,579)	(\$290,572)	(\$382,331)	(\$157,325)		
1. Coal Lands						
2. Plant & Equipment				\$ 12,187		
3. Work in Progress				162,365		
Total				<u>\$174,552</u>		
I. Net Profit after FIT as percent of Net Sales Realization					15.12	
J. Gross Cash Generation as percent of Net Sales Realization					27.02	

**FOOTNOTES:****Basis for Projection:**

(b) Fee: 209,199 tons, Book Value	\$ 12,187
Total amount to be depreciated	\$ 82,365
Assumed cost of Working Capital at 1.25 percent of Sales Realization	\$ 7,453
Estimated Salvage Value 9 months hence	\$220,000
Depreciated Value Plant and Equipment September 30, 1959 - \$162,365	
minus -82,365 or	\$ 80,000

**COMPUTATION OF VALUES**

Production in Tons	209,199	
Estimated Gross Cash Generation	\$214,782	\$1.0267
Assumed cost of working capital	7,453	0.0356
	<u>\$207,329</u>	0.9911
Present Worth Factor 9 months at 10 percent annually	0.93023	
Present Worth as of 12/31/1959	\$192,864	
Present Worth of Depreciated Value plus Salvage Value, (Total \$300,000)	\$279,069	
Total Value as of 12/31/1949	\$471,933	

**EXHIBIT E**  
**VALUATION DATA**

**RAVIER MINE**

**Projection for 12 Years**

A. Production in Tons	9,471,469	(789,289)
B. Total Cost of Production, Sales & Administration	Amount	Per Ton
1. Costs other than B-2, B-3, B-4	\$32,314,048	\$3.4117
2. Royalty	433,041	0.0457(a)
3. Depreciation	3,068,288	0.3240
4. Sustained Depletion	1,123,352	0.1186(b)
Total	\$36,938,729	\$3.9000
C. Net Sales Realization	\$49,725,212	\$5.2500
D. Total Cost	36,938,729	3.9000
E. Pre Tax Profit	12,786,483	1.3500
F. Federal Income Tax	4,603,921	0.4861
G. Net Profit after FIT	8,182,562	0.8639
ADD:		
D-4 Sustained Depletion	1,123,352	0.1186
B-3 Depreciation	3,068,288	0.3240
G. Gross Cash Generation	\$12,374,202	\$1.3065
I. Net Profit after FIT as percent of Net Sales Realization	16.46	
J. Gross Cash Generation as percent of Net Sales Realization	24.89	

**COMPARISON OF VALUES**

Production in Tons	9,471,469	
Estimated Gross Cash Generation	\$12,374,202	\$1.3065
Assumed cost of Working Capital, (1.25 percent of Sales Realization)	621,565	0.0656
	11,752,637	1.2409
Deduct Reinvestment	568,288	0.0600
	\$11,184,349	\$1.1809
Present Worth Factor, 12 years at 10 percent	0.56781	
Present Worth as of December 31, 1959	\$6,350,585	
LESS:		
Amount of original investment remaining to be made as of December 31, 1959	2,953,080	
	3,397,505	
PLUS:		
Present Worth of \$1,500,000 12 years hence	477,945	
	\$3,875,450	

**FOOT NOTES:**

(a) Royalty: 1,732,163 tons @ \$9.25	\$ 433,041
(b) Rent: 7,739,306 tons, Book Value	\$1,123,352
Necessary Reinvestment estimated at 9,471,469 tons @ \$0.06 per ton	\$ 568,288
Estimated Original Investment in Plant and Equipment	\$4,000,000
Estimated Value, 12 years hence	\$4,563,288
Amount to be depreciated	\$1,500,000
Estimated total Original Investment in Plant & Equipment	\$4,000,000
Investment as of December 31, 1959	\$1,046,920
Remainder of Investment in Plant and Equipment to be made as of December 31, 1959	\$2,953,080



# SUMMARY OF VALUES

	Buckheart, Including RR & RT	Cuba	Fidelity	Mary Moore	Banner	Additional Assets Directly Connected with Mine Operation
Book Values as of December 31, 1959:						
Coal Lands, Fee	\$2,220,410	\$ 300,830	\$1,775,037	\$12,187	\$1,123,352	-
Coal Lands, Purchase Options	-	-	29,000(b)	-	-	-
Plant and Equipment	2,806,267	2,586,955	2,002,917	162,365	135,584	\$105,392(a)
Work in Progress	44,496	-	8,391	-	911,066	-
Total	\$5,071,173	\$2,887,785	\$3,815,345	\$174,552	\$2,170,272	\$105,392
Recoverable Coal Reserves:						
Owned in Fee	15,497,534	4,501,762	23,511,549	209,199	7,739,306	-
Leased	6,569,618	391	6,097,513	-	1,732,163	-
Purchase Options	-	-	-	-	-	-
Total	\$22,066,152	\$4,502,153	\$29,609,062	\$209,199	\$9,471,469	-
Projections:						
Annual Production	1,298,067	750,359	1,184,362	209,199	789,239	-
Estimated Life, Years	17	6	25	0.75	12	-
Following are on per-ton basis:						
Estimated Sales Realization	\$4.5300	\$4.2900	\$3.8000	\$3.8000	\$5.2500	-
Estimated Total Costs	3.4381	3.4897	3.4408	3.0400	3.9000	-
Estimated Profit before Federal	1.0919	0.8007	0.3512	0.7500	1.3500	-
Estimated Profit after Income Tax	0.7085	0.5800	0.2287	0.5747	0.8639	-
Estimated Gross Cash Generation	\$1.0371	\$1.0593	\$0.4831	\$1.0267	\$1.3065	-
Percentage of Sales Realization:						
Recovered as Profit after FIT	15.64	13.52	6.62	15.12	16.46	-
Recovered as Gross Cash Generation	22.89	24.69	12.69	27.02	24.89	-
Paul Weir Company's opinion of Value as of December 31, 1959	\$9,160,413	\$3,796,305	\$3,463,939	\$471,933	\$3,875,490	-

## FOOT NOTES:

- (a) The total amount, \$870,693, of classification "General" is allocated by us. U.E.C. has not furnished break-down.
- (b) Of this, \$29,000, there is a balance due of \$19,500. This balance due is not shown under Liabilities on the balance sheet.



<u>Total Active Mines</u>	<u>Steel Barges</u>	<u>Farm Buildings &amp; Equipment</u>	<u>Kington River Terminal</u>	<u>Inactive Coal Reserves</u>		<u>Grand Total</u>
				<u>Strip</u>	<u>Underground</u>	
\$5,460,816				\$1,912,885		\$7,373,700
7,799,750	\$415,300(a)	\$200,000(a)	\$150,000(a)			8,565,050
963,953						963,953
\$14,224,519	\$415,300	\$200,000	\$150,000	\$1,912,885		\$16,902,703
51,459,350				22,280,018	3,352,628	77,091,996
14,399,685				1,840,310	27,075,682	43,315,677
					2,218,621	2,218,621
\$65,859,035				24,120,328	32,646,931	122,626,294

\$20,768,040	\$415,300	\$200,000	\$150,000	\$1,912,885	\$23,446,225
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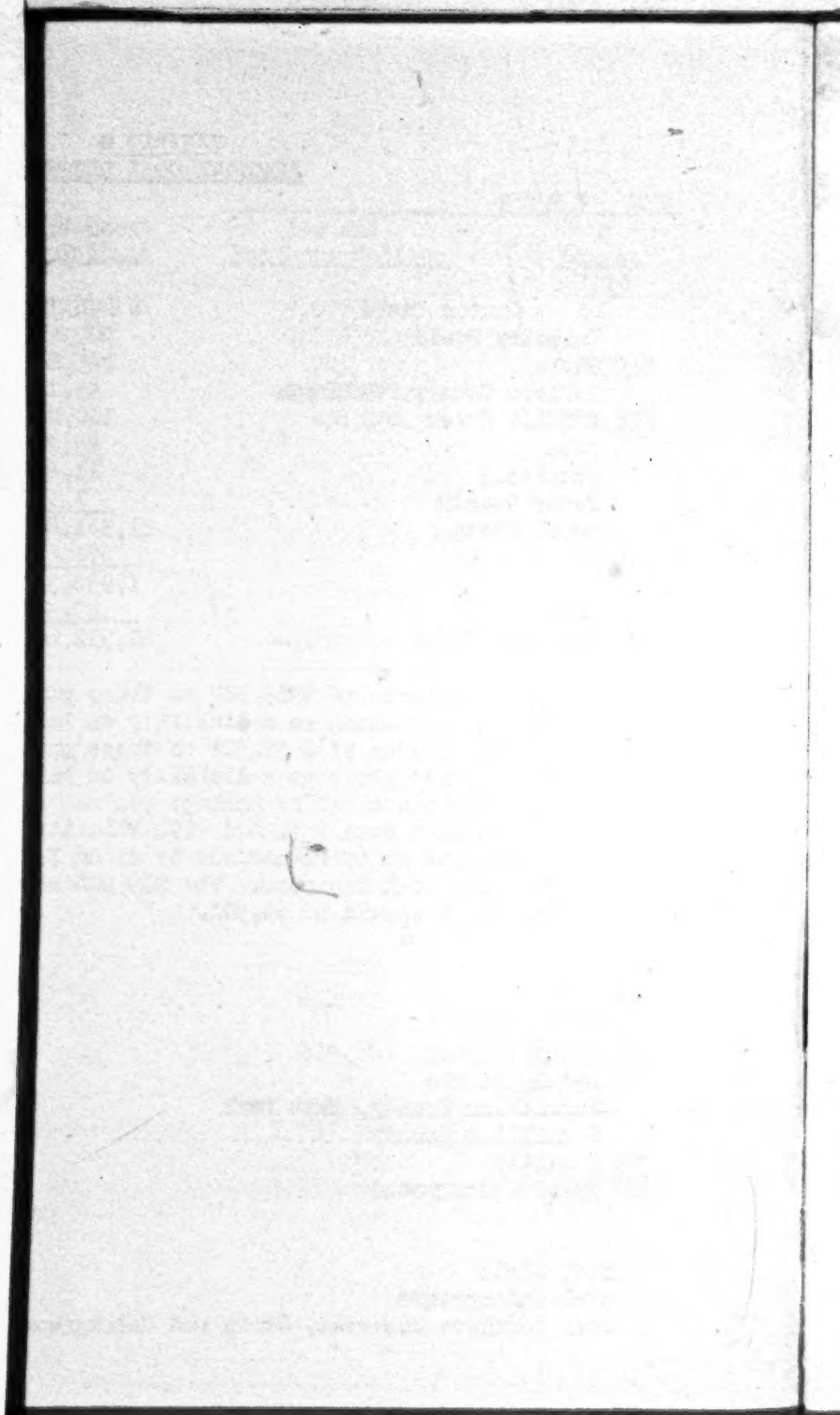
EXHIBIT G  
INACTIVE COAL RESERVES

	Book Value of Fee	Payments Made on Purchase Options	TONS RECOVERABLE			Total
			Fee and Purchase Options	Leases	Purchase Contract	
<b>STRIP:</b>						
No. 1 Canton Field	\$ 476,308	\$492,073(a)	9,077,630	-	-	9,077,630
Industry Field	537,570	78,825(b)	9,626,717	-	-	9,626,717
Gayle	145,886	-	785,773	928,937	-	1,714,710
LeFlore County, Oklahoma	45,125	-	2,301,872	-	-	2,301,872
Buffalo Creek	100,000	-	488,026	911,373	-	1,399,399
Cuba	43,766(c)	-	-	-	-	-
Buckheart	11,696(c)	-	-	-	-	-
Perry County	1,135(d)	-	-	-	-	-
Total Strip	\$1,361,487	\$570,898				
	570,898					
	1,932,385					
Less	19,500(e)					
Net Book Value	\$1,912,885		22,280,018	1,840,310		24,120,328

- (a) Unpaid balance of \$365,987 on these purchase options. This is not shown as a liability on balance sheet.
- (b) Unpaid balance of \$ 52,500 on these purchase options. This is not shown as a liability on balance sheet.
- (c) Represents coal under haulage roads.
- (d) Should have been included with Fidelity or Gayle.
- (e) Represents an overstatement by us on Book Value of Fidelity Coal Reserves. The \$29,000 shown on Exhibit F should be \$9,500.

UNDERGROUND:

	Fee	Leases	Purchase Contract	Total
Buffalo Creek	314,316	3,769,581	-	4,083,897
Round Prairie	-	18,743,721	2,218,621	20,962,342
Vernillion County, Salt Fork	691,152	-	-	691,152
Vernillion County	1,795,360	-	-	1,795,360
Fidelity	551,800	4,562,380	-	5,114,180
Total Underground	3,352,628	27,075,682	2,218,621	32,646,931
Total Strip				24,120,328
Total Underground				32,646,931
Total Inactive Reserves, Strip and Underground				56,767,259





## KOLBE DEPOSITION EXHIBIT 60

REGARDING NEED FOR ADDITIONAL STRIPPING  
EQUIPMENT AT FIDELITY MINE

In the so-called Green Pit where we are currently working, the overburden is such that the 1650-B can mine nearly all of it without any additional stripping equipment. Toward the end of the field, a helper would be desirable to maintain production and costs.

This Green Pit will be mined out within two to two-and-a-half years. Beyond that, the estimated reserves at Fidelity that can be stripped is 23,000,000 tons. Investigation of the three different areas comprising this 23,000,000 tons shows overburden depths and hard rock requiring a helper for the 1650-B to mine it out economically and to mine all of the 23,000,000 tons. Without a helper, our production would be reduced from the current rate of 180,000 tons per month to about 125,000 tons, with a resultant increase in cost. Also, of this 23,000,000 tons, there is approximately 10,000,000 tons that could not be mined at all with the one machine (1650-B). Therefore the need for additional equipment has been established.

We feel a wheel, properly designed to work with the 1650-B, is the answer. The following information and estimates have been developed.

1. Bucyrus-Erie has a standard design and has built a wheel for Peabody and one for Truax. It is high enough for us, but for our purpose certain modifications of design seem necessary. They put a price on their standard design of \$2,500,000, and an estimate on transportation and erection of \$400,000.

While we don't know exactly what the change in design we would need would cost, they have indicated that the engineering and other factors involved would cost somewhere in the neighborhood of another \$400,000. So it appears we are thinking about something over \$3,000,000 for a Bucyrus machine in place and ready to operate.

2. We have built four wheels, three of which are now in operation. The W-2 is at Buckheart, the W-3 at Banner, and the W-4 at Cuba. The W-3 was originally at Fidelity Mine but because of the design of this particular machine, never proved successful there.

It was redesigned and moved to Banner and our cost and profit record there will indicate its satisfactory performance.

The wheels at both Buckheart and Cuba are doing a very satisfactory job.

3. We have all of the engineering information, blue-prints and so forth necessary to build the type of wheel we need at Fidelity. This, of course, is quite a cost saving.

The machine would be built higher, the digging end longer, and the stacker end some longer and higher to place the dirt back far enough in deep overburden to avoid slides. We would use the base, motors and quite a lot of other material from the 5561 Marion shovel which is now used as a stand-by at Fidelity. You will recall the details of trading this machine in and then buying it back at a cost of \$250,000, including all parts.

4. Utilizing our engineering knowledge, blue prints, and experience, and building the machine on the site, would effect considerable savings. The repair parts in inventory for the 5561 and also repair parts in inventory for Wheels 2, 3 and 4 would be available for the W-5 machine.

5. Our estimate of the total cost, using our own people for the engineering and supervision, and contracting for the welding, erection and so forth, is \$1,500,000. This does not include any capital charge for the material used from the Marion 5561. This is on our books at \$\_\_\_\_\_ today.

We feel our estimates are within reason but for contingencies and unexpected difficulties, we could add considerably and still be way below the cost of buying a wheel from Bucyrus-Erie.

In our five-year budget for capital expenditures, we included \$\_\_\_\_\_ in 1966 and \$\_\_\_\_\_ in 1967.

We can build this machine and have it in operation within fourteen months. The best estimate from Bucyrus is eighteen months and probably longer.

6. John Murray has prepared financial data on return on investment and so forth, which is attached hereto.

**J. M. MORRIS**



July 10, 1956

GOVERNMENT  
 DEPOSIT  
 Kol. Dep.  
 61

THIS AGREEMENT made and entered into at Pittsburgh, Pennsylvania the 5<sup>th</sup> day of September, 1956, by and between THE UNITED ELECTRIC COAL COMPANIES, a Delaware corporation having its principal office in Chicago, Illinois, (hereinafter called "United"), and ALUMINUM COMPANY OF AMERICA, a Pennsylvania corporation having its principal office in Pittsburgh, Pennsylvania, (hereinafter called "Alcoa").

## WITNESSETH:

WHEREAS, Alcoa desires to obtain options to purchase the coal and coal mining rights in and under certain lands located in Perry County, State of Illinois, together with all other available minerals and mineral and mining rights in said land, and

WHEREAS, Alcoa desires that said options be obtained without disclosing the identity of Alcoa, and

WHEREAS, United has indicated its willingness to obtain said options in the name of United and hold said options in trust for Alcoa and thereafter at the request of Alcoa, assign and convey said options to Alcoa, and

WHEREAS, Alcoa shall, from time to time, desire United to perform or cause to be performed certain prospecting, drilling, exploration and other work on said lands or relating to said lands, and

WHEREAS, United has indicated its willingness to perform or cause to be performed such prospecting, drilling, exploration and other work,

NOW THEREFORE, United and Alcoa, in reliance upon the covenants herein contained, hereby covenant and agree as follows,

intending to be legally bound thereby:

1. United shall undertake to obtain, in its own name and without disclosing that it is acting for Alcoa, recordable and assignable options for the purchase of the coal and coal mining rights, together with all other available minerals and mineral and mining rights, in at least Eighteen Thousand (18,000) acres but not more than Twenty-Five Thousand (25,000) acres of land located east and north of Pinckneyville, Perry County, Illinois as outlined in red on the map marked "Exhibit A" and attached hereto, paying to the owner or owners of said land as consideration for each option so obtained the sum of One Dollar (\$1.00) per acre of land. United shall, in so far as is practicable, obtain said options in such a manner that the optioned tracts of land will be contiguous and constitute a solid block.

2. Until United is otherwise directed, in writing, by Alcoa, each option so obtained by United shall be in the form marked "Exhibit B", attached hereto, and shall provide for the payment to the owner or owners of said land, in the event the option is exercised, of a total purchase price not to exceed the sum of Fifty Dollars (\$50.00) per acre of land.

3. United shall without undue delay cause each option so obtained to be recorded in the appropriate records of Perry County, Illinois.

4. United does hereby acknowledge and declare that it will hold said option in trust for Alcoa, and that United will not claim to have any right, title or interest in said options to its own use or benefit. United does hereby covenant with Alcoa that it will, immediately after the same has been recorded, convey and assign and deliver each option so obtained by United to Alcoa or to such other person or corporation as Alcoa shall in writing nominate or appoint.

(5) At such time as Alcoa shall designate, United shall cause the optioned lands to be properly drilled on approximately one-half mile centers and shall cause the cores to be examined and logged by a competent consulting engineer. United shall cause the coal samples to be analyzed by Commercial Testing Laboratory in Chicago, Illinois and shall promptly deliver to Alcoa the results of such analysis.

(6) On or before the tenth day of each month, United shall invoice Alcoa for, and Alcoa shall thereafter promptly pay, such charges as shall be due and owing to United by Alcoa on account of performance hereunder by United during the previous month. Such charges shall consist of the following:

- A. Payments made to the owners of land optioned in accordance with the terms hereof and the cost of recording the options.
- B. Payments made for salaries and wages of persons employed by United solely for the purpose of obtaining options hereunder.
- C. An amount which is equal to one and one-half times the portion of the salaries of United's engineering and land acquisition employees which is attributable to United's performance hereunder on the basis of actual time spent by such employees in performance hereunder.
- D. The actual cost of causing the drilling, examination and logging of cores, and analysis of samples to be performed pursuant to Article 5 hereof.

X. Expenses incurred for meals, lodging, transportation, telephone and telegraph messages, engineering supplies and office supplies.

7. United shall, at any time upon receipt of written notice from Alcoa to do so, immediately cease, or temporarily suspend, the obtaining of options hereunder.

8. This agreement may be terminated by either United or Alcoa by giving thirty (30) days prior written notice of such termination.

9. In the event Alcoa decides to drop the options acquired under this Agreement, said options shall at the election of United be reassigned by Alcoa to United upon the reimbursement by United to Alcoa of all charges theretofore paid by Alcoa to United pursuant to the provisions of Paragraph 6 hereof, plus any renewal payments theretofore made on said options by Alcoa.

10. Notices to United provided for herein shall be deemed to be properly given when deposited in the United States mail, registered and postage prepaid, addressed to:

T. H. Latimer  
The United Electric Coal Companies  
307 North Michigan Avenue  
Chicago 1, Illinois

Notices to Alcoa provided for herein shall be deemed to be properly given when deposited in the United States mail, registered and postage prepaid, addressed to:

R. F. Miller, Mining Division  
Aluminum Company of America  
1501 Alcoa Building  
Pittsburgh 19, Pennsylvania

11. This agreement shall inure to the benefit of and shall be

binding upon the parties hereto and their respective successors and assigns.

IN WITNESS WHEREOF the parties hereto have caused this agreement to be executed by their duly authorized officers the day and year first above written.

Attest:

THE UNITED ELECTRIC COAL COMPANIES

Frederick Back  
SECRETARY

By Frank F. Holbe  
President

Attest:

ALUMINUM COMPANY OF AMERICA

Cepes W. Thomas  
SECRETARY

By Lawrence C. Cuthbert  
Vice President

State of Illinois )  
County of Cook ) SS.

I, Samuel M. Stiglich, do hereby  
certify that on the 1st day of September, 1936,  
Frank F. Holbe and G. H. Hottelbach  
personally appeared before me and

being first duly sworn by me severally acknowledged that they signed  
the foregoing document in the respective capacities therein set forth  
and declared that the statements therein contained are true.

In witness whereof, I have hereunto set my hand and seal the  
day and year before written.

(Seal)

Samuel M. Stiglich

State of Illinois )  
County of Cook ) SS.

I, Samuel M. Stiglich, do hereby

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certify that on the 5th day of September, 1956,

Lawrence Littlefield Jr. and Alfred McArthur

personally appeared before me

and being first duly sworn by me severally acknowledged that they  
signed the foregoing document in the respective capacities therein  
set forth and declared that the statements therein contained are true.

In witness whereof, I have hereunto set my hand and seal the  
day and year before written.

(Seal)

Lola Hughes

LOLA HUGHES, NOTARY PUBLIC  
MY COMMISSION EXPIRES  
FEBRUARY 2, 1967



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**THE UNITED ELECTRIC COAL COMPANIES**

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COMPARISON BETWEEN TRUAX-TRAEER COAL COMPANY

AND

THE UNITED ELECTRIC COAL COMPANIES

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*L*

October 8, 1966

Herewith a comparison of ourselves and Truax-Truer based primarily on tons produced in each locality per annum showing what we would get in a merger and what we might be giving. The earnings by United and Truax per ton from the coal in each area should be the same over a period of time, as the overburden in each area is about the same on the average. Some years overburden will be much lower at one mine than another, resulting in lower stripping cost and lower blasting cost, but it will average out.

At present in Fulton County we are producing the same tons as Truax, but our potential reserves are 65 per cent greater, and ultimately this will be represented in production and sales. We are now building a new, larger wheel at our Cuba mine which will increase our capacity there 600,000 tons a year, and we are also considering the acquisition of a mine in the Banner area on the Illinois River just below Peoria. This mine is now producing 200,000 tons a year, and we might increase this to 700,000 tons. If we did this, our total capacity in Fulton County would be 3,300,000 tons, as compared with Truax's present 2,100,000. In Southern Illinois Truax has much larger reserves than we do, but I do not think this is a particularly good place to have reserves. Our Danville and Buffalo creek mines are very profitable mines, as profitable as or more profitable than similar mines in Fulton County. The Truax mines in West Virginia and North Dakota are out of our territory, and I do not know anything about them.

None of the benefits would come from the Truax properties then from our own. At present the tonnage from the Little Sister properties goes to the Little Sister washer and then goes by Burlington Railroad to the Truax dock. He would take this to Buckhorn and then down our railroad. At the Shakerag mine of Truax, the combined company might save money by putting in a washer to prepare only two sizes of coal, 2 x 4 and 2 x 0. The various other sizes could be produced at the Fidelity washer. This would make for a cheap and economical-to-run washer at the Shakerag properties.

For a consolidated company, the West Virginia tonnage does not have as much purpose as in the present Truax company, as in a consolidated company it would be only a fifth of the total output, instead of a third, and if certain expansion that we are contemplating were put through, it would be only a sixth. Under these circumstances, it would be only the tail of the dog, with its can mixing and selling problems that would be completely different from the problems of the other 80 per cent. I doubt whether under these circumstances it would get the same progressive, forward-looking attention that the other 80 per cent would, and whatever it did get might detract from the attention that should be given to the properties in the Middle West. With the present move toward consolidations in the East and toward acquisition of property, it might be that this property could be sold and the funds distributed to the present Truax stockholders, or they might be given preferred stock.

If the Eastern properties were taken out, our relative production would be as follows:

	<u>United's Production</u>	<u>Trunk's Production</u>	<u>Excess of Trunk's Production Over United's</u>
Fulton County	2,100,000	2,100,000	-
Railroad - Profits in form of Coal Equivalent	500,000	-	(500,000)
Danville	500,000	-	(500,000)
Buffalo Creek	500,000	-	(500,000)
Total	5,000,000	2,100,000	(500,000)
Southern Illinois	1,500,000	2,500,000	1,000,000
Total	4,500,000	4,600,000	100,000
North Dakota	-	1,500,000	1,500,000

The earnings from the 6,100,000 would not be far different from the earnings from the 4,500,000.

We are in a position now to go ahead with some expansion, and if we did so, we would be sharing the benefits of this with Trunk. On the other hand, they would be paying their share of it. We have the possibility now of earning \$5.50 or \$6.00 a share from our present properties and of opening new mines which would increase those earnings. I just want to be sure that in a merger our earnings per share per annum would be increased.

COMPARISON OF NET INCOME IN YEAR ENDED JULY 31, 1956

United Electric earned \$1,631,655 or \$2.45 a share on 677,020 shares for the year ended July 31, 1956. Truax-Tracor during its fiscal year ended three months earlier - April 30, 1956 - earned \$3,212,518 which, after preferred dividends, was equivalent to \$2.51 a share on the 1,149,530 shares of common stock outstanding at April 30, 1956. Included in the Truax earnings of \$3,212,518 is \$567,516 after taxes or 59 cents a common share realized from the sale during the year of coal lands in Western Kentucky. Excluding the capital gain and changing the year to July 31, Truax's earnings were \$2,991,169. This is \$2.20 per share on the 1,368,340 shares outstanding allowing for full conversion of the preferred but does not include shares recently issued for the acquisition of Little Sister. Based on earnings for the year ended July 31, 1956, United should get 1 1/10 shares of Truax but United's earnings last year do not reflect the present and future situations.

ESTIMATED NET INCOME FOR UNITED IN YEAR ENDED JULY 31, 1957

For the present fiscal year ending July 31, 1957, it is estimated that United Electric's earnings will be as follows:

Mine	Tonnage	Operating Income	
		Per Ton	Amount
Cuba	800,000	\$1.00	\$ 800,000
Buckheart	1,300,000	.06	1,105,000
B.R. & R.T.	(1,200,000)	.26	500,000
Fidelity	1,500,000	.50	750,000
Mary Moore	800,000	1.00	800,000
Buffalo Creek	800,000	1.00	800,000
	<u>4,200,000</u>		<u>\$3,565,000</u>
Less - Federal income taxes			<u>1,100,000</u>
Net income			<u>\$2,465,000</u>
Net income per share on 677,020 shares			<u>\$ 3.62</u>



United Electric is building a new wheel for Cuba which will increase the capacity of that mine by 800,000 tons. It is estimated that Cuba's costs will be reduced 10 cents to 15 cents a ton using the new wheel, and when the added capacity is sold, that will result in an additional cost reduction.

The north field at Buckheart has been opened, and United is about to move to that area. When this move is completed, Buckheart's costs will be reduced, as the average overburden ratio is 14 to 1 in the north field, compared with 18.9 to 1 during the past year.

At Fidelity the deepest overburden ratio is now being stripped. The average depth of overburden was 84 feet this past year, and some was 80 feet with very heavy rock. Across the road is 11 million tons under 80 feet.

#### CASH THROUGH AND WORKING CAPITAL POSITION

United Electric's working capital was \$3,179,226 at July 31, 1956. An estimate of the increase in working capital for the fiscal year 1956 is as follows:

	<u>Amount</u>	<u>Per Share</u>
<b>Additions:</b>		
Net income from operations	\$3,636,000	
Add depreciation and depletion	<u>1,660,000</u>	
	\$5,296,000	\$5.76
<b>Deductions:</b>		
Land payments	\$ 480,000	
Plant and equipment purchases	500,000	
Dividends	<u>678,000</u>	
	\$1,658,000	2.60
Estimated increase in working capital before other capital expenditures	<u>\$2,277,000</u>	<u>\$3.56</u>

At the end of the present fiscal year United Electric's working capital could be over \$5,000,000, or the anticipated increase would be available to add new mines or for other purposes.



Truax-Truax's working capital April 30, 1956, was \$9,886,154. Long-term indebtedness, of which United has none, was \$3,816,622. Deducting cash received from this, to make figures comparable, would reduce Truax's working capital to \$6,069,532.

United has followed a different policy in the purchase of coal lands in Fulton County. Truax has an investment in lands in Fulton County of \$977,227. United has an investment of \$4,095,048. United is now negotiating for the sale of this land which, if done, would increase its working capital.

United Electric's present mines are equipped to handle all the overburden at those mines without additional equipment, except for the expenditure of \$1,250,000 for a new wheel at Cuba, which will increase the capacity of that mine by a half-million tons a year.

#### RESERVES

##### Fulton County and Adjacent Area

Fulton County is often called the most profitable coal-mining district in the United States. A comparison of the Fulton County area reserve tonnages of United Electric at July 31, 1956, and of Truax-Truax as of about a year earlier is as follows:

	<u>Reserve Tons</u>	<u>Overburden Ratio</u>
Cuba	6,805,939	18.6 to 1
North Canton	8,251,630	18.7 to 1
	<u>14,757,569</u>	
Buckheart	21,694,771	14.0 to 1
Banner	3,421,921	17 to 1
McDonough County	8,978,117	22.7 to 1
	<u>12,868,038</u>	
	<u>68,720,608</u>	

In addition to the above tonnage, United can probably acquire 10,000,000 additional tons in the North Canton area, 9,000,000 tons for Buckheart,

6,600,000 tons in the Banner area, and 1,000,000 tons in McDonough County - a total of 28,500,000 additional reserves. United Electric's reserves in this area would then be:

	<u>Reserve Tons</u>	<u>Overburden Ratio</u>
Cuba	6,605,239	
North Canton	12,251,620	
	<u>24,737,859</u>	
Buckheart	50,534,771	
Banner	9,621,921	
McDonough County	9,978,117	
	<u>19,600,038</u>	
	<u>75,220,668</u>	

United is now selling 2,100,000 tons per annum from Fulton County. The above reserves would give United a life in the Fulton County of 35 years. United is now building a wheel at Cuba which will increase this capacity to 2,600,000 tons per annum and is also considering the purchase of a mine in the Banner field with a present production of 200,000 tons a year which will later be increased to 700,000 tons making a total for this area of 3,500,000 tons per annum.

The Truax reserves in Fulton County are:

	<u>Reserve Tons</u>	<u>Overburden Ratio</u>
Flatt	20,444,339	15.6 to 1
Little Sister	10,000,000	
	<u>30,444,339</u>	
Probable Future Acquisitions	15,000,000	
	<u>45,444,339</u>	

Truax is now selling 2,100,000 tons per annum from Fulton County. These reserves would permit Truax a life in Fulton County of 22 years.

#### Southern Illinois

In Southern Illinois United Electric and Truax-Truax have the following reserve tonnages:

	Reserve Tons	Overburden Ratio
United Electric:		
Fidelity	<u>27,681,498</u>	10.2 to 1
Annual Production	<u>1,500,000</u>	
Trunk-Tracer:		
Shaboreg - Pyramid	31,803,594	12.5 to 1
Burning Star - Strip	6,678,143	15 to 1
Sparta	10,571,000	11.2 to 1
Jamestown	<u>18,308,400</u>	9.3 to 1
Total Strip	<u>67,152,143</u>	
Burning Star - Drift	<u>12,510,087</u>	
Total Trunk	<u>79,662,170</u>	
Annual Production	<u>2,500,000</u>	

The foregoing reserve tonnages are as of July 31, 1956, for United Electric and as of about a year earlier for Trunk-Tracer.

#### Mary Moore

At July 31, 1956, United Electric had reserve tonnage at the Mary Moore mine near Danville, Illinois, amounting to 1,118,583 at an average overburden ratio of 10.2 to 1. We are now obtaining options on an additional several million tons in this field.

#### Buffalo Creek

United Electric has reserve tonnages at Buffalo Creek at July 31, 1956, as follows:

	Reserve Tons	Overburden Ratio
Strip Coal	1,540,165	
Deep Coal	<u>8,762,668</u>	17.3 to 1

United as an option to acquire on a royalty basis from Jenkins Coal Mining Company additional reserves of #6 coal which are located about five miles from the Buffalo Creek property. The Jenkins property has possibly the largest reserves of #6 coal in Western Kentucky. About 2 million tons of #4 coal are also included in the option.

West Virginia and North Dakota

In addition to its Illinois mines, Truax has West Virginia and North Dakota properties:

West Virginia:  
Reserves

167,660,153

Production Year Ended April 30, 1956

2,439,806

North Dakota:  
Reserves

103,209,828

Production Year Ended April 30, 1956

1,676,936

Miscellaneous

United Electric owns or controls 1,734,998 tons of strip coal in Ohio County, Kentucky; 2,501,872 tons of strip coal in Oklahoma; 1,795,360 tons of deep coal in Vermilion County, Illinois; and 883,084 tons of deep coal in Perry County, Illinois, leased to Union Electric.

RECAP

United Electric with its present mines can produce 4,500,000 tons and could earn \$2,700,000 or \$4.00 a share on this production. These earnings assume that we can build up our summer business in Fulton County.

United Electric in 1958 will increase its capacity 800,000 tons per year through the operation of its new wheel at the Cuba mine. It is believed this additional coal can be sold to the new power plant to be built by the Central Illinois Light Company in Peoria or to other customers.

United Electric may also open a new mine in the Banner Field on the Illinois River near Peoria. This coal, when washed, would have 12,000 B.T.U.'s. This would be West Kentucky coal on an Illinois River freight rate. This coal would have a market value at utility plants on Lake Michigan of \$4.50 a ton. Our profit might run \$1.60 a ton and be greater than at any mine we now have. The total profit in this field might be \$1,060,000 a year, or \$700,000 after taxes.

If the Jenkins field works out as we think it may, it would be a very substantial earner, as this coal sells for \$6.50, and with the sort of equipment that we are thinking of for this field, we should earn \$2.00 a ton before taxes. We could probably sell 600,000 tons a year from this mine on which the earnings after taxes would be \$600,000.

The additional net income from these two properties might be \$2.00 a share on our stock.



**TRUAX-TRAER COAL COMPANY  
AND  
THE UNITED ELECTRIC COAL COMPANIES  
ANNUAL SALES IN TONS**

Year Ended April 30, 1958

		<u>Truax-Traer</u>	<u>United Electric</u>
<b>Fulton County:</b>			
Piatt	1,621,547		
Little Sister	636,502		
United Electric		2,158,049	
Mary Moore			1,900,231
Buffalo Creek			200,023
			512,725
		<u>3,158,049</u>	<u>2,612,979</u>
<b>Southern Illinois</b>			
		2,379,581	1,217,025
		<u>4,537,630</u>	<u>3,630,004</u>
<b>West Virginia</b>			
<b>North Dakota</b>			
		2,469,805	
		<u>1,476,966</u>	
<b>Total</b>		<u><u>8,464,401</u></u>	<u><u>3,830,004</u></u>

Our railroad has a net profit before taxes of \$800,000 which is the amount of profit that could be made from 300,000 tons of coal.

Profitwise we now have the equivalent of 3,950,000 tons of coal from present production and with Banner and Jenkins present production added this would be 4,450,000 tons. With Banner and Jenkins operating the way we might develop them, our production would be greater.



Present United Electric and Truax-Truax-Little Sister Properties  
(Does not include Danmor or Jenkins acquisitions)

If United Electric were to receive 1 1/10 shares for each share of Truax, the consolidated company would have 2,280,000 shares, of which United would have 750,000 shares, or a third:

	<u>United's Percent Production</u>	<u>Consolidated Companies' Production</u>	<u>United's Share in Consolidated Production 1/3 of Total Tons</u>
Fulton County	2,100,000	4,200,000	1,400,000
Railroad - Profit in Tons of Coal Equivalent	500,000	400,000	160,000
Danville	300,000	300,000	100,000
Buffalo Creek	300,000	300,000	100,000
	<u>3,000,000</u>	<u>5,200,000</u>	<u>1,760,000</u>
Southern Illinois	<u>1,800,000</u>	<u>4,000,000</u>	<u>1,333,000</u>
	<u>4,800,000</u>	<u>9,200,000</u>	<u>3,093,000</u>
West Virginia	-	2,800,000	833,000
North Dakota	-	<u>1,500,000</u>	<u>500,000</u>
Total Tons	<u>4,600,000</u>	<u>13,260,000</u>	<u>4,416,000</u>

United would give up the earnings from 1,280,000 tons of Fulton County or equivalent production and 167,000 tons of Southern Illinois production; it would receive the earnings of 1,333,000 tons of West Virginia and North Dakota production.

Present United Electric and Trux-Trear-Little Sister Properties  
 (Does not include Harner or Jenkins acquisitions)

If United were to receive 1 1/2 shares of Trux-Trear, the consolidated company would have 2,800,000 shares, of which United would have 1,000,000 shares, or 40 per cent:

	<u>United's Present Production</u>	<u>Consolidated Companies' Production</u>	<u>United's Share in Consolidated Production 40 Per Cent</u>
Fulton County	2,100,000	4,200,000	1,680,000
Railroad - Profit in Tons of Coal Equivalent	300,000	450,000	180,000
Denville	300,000	300,000	120,000
Buffalo Creek	<u>300,000</u>	<u>300,000</u>	<u>120,000</u>
	3,000,000	5,250,000	2,100,000
Southern Illinois	<u>1,500,000</u>	<u>4,000,000</u>	<u>1,600,000</u>
	4,500,000	9,250,000	3,700,000
West Virginia	-	2,500,000	1,000,000
North Dakota	<u>-</u>	<u>1,500,000</u>	<u>600,000</u>
Total Tons	<u>4,500,000</u>	<u>13,250,000</u>	<u>5,300,000</u>

United would give up 800,000 tons of Fulton County production or equivalent production and receive 100,000 tons of Southern Illinois production along with 1,600,000 tons of West Virginia and North Dakota production.

United Electric with Banner and Jenkins mines and  
Truax-Tracy with Little Sister

If United Electric were to receive  $1 \frac{1}{10}$  shares for each share of Truax, the total capitalization of the new Truax would be 2,250,000 shares, of which United would receive 750,000 shares, or a third:

	<u>United's Present Production with Banner and Jenkins Developed</u>	<u>Consolidated Companies' Production</u>	<u>United's Share in Consolidated Production <math>\frac{1}{3}</math> of Total Tons</u>
<b>Present Production:</b>			
Fulton County	2,100,000	4,200,000	1,400,000
Railroad - Profit in Tons of Coal equivalent	300,000	600,000	150,000
Danville	300,000	300,000	100,000
Buffalo Creek	300,000	300,000	100,000
	<u>3,000,000</u>	<u>5,250,000</u>	<u>1,750,000</u>
<b>Likely Production</b>			
Banner	700,000	700,000	233,000
Jenkins	800,000	800,000	200,000
	<u>4,300,000</u>	<u>6,850,000</u>	<u>2,183,000</u>
<b>Southern Illinois</b>	<u>1,800,000</u>	<u>4,000,000</u>	<u>1,333,000</u>
	<u>5,800,000</u>	<u>10,850,000</u>	<u>3,516,000</u>
<b>West Virginia</b>	-	2,000,000	333,000
<b>North Dakota</b>	-	1,600,000	500,000
	<u>5,800,000</u>	<u>14,450,000</u>	<u>4,849,000</u>

United would give up 2,250,000 tons of Midwestern production for 1,753,000 tons of West Virginia and North Dakota production.

United Electric with Banner and Jenkins Mines  
Trux-Truxer with Little Sister

If United were to receive 1 1/2 shares of Trux-Truxer, the total new capitalization would be 2,500,000 shares, of which United would get 1,000,000 shares, or 40 per cent:

	United's Present Production with Banner and Jenkins Developed	Consolidated Companies' Production	United's Share in Consolidated Production 40 Per Cent
<b>Present Productions:</b>			
Fulton County	2,100,000	4,200,000	1,680,000
Railroad - Profit in Tons of Coal Equivalent	300,000	450,000	180,000
Duquille	300,000	300,000	120,000
Buffalo Creek	300,000	300,000	120,000
	<u>3,000,000</u>	<u>5,250,000</u>	<u>2,100,000</u>
<b>Likely Productions:</b>			
Banner	700,000	700,000	280,000
Jenkins	600,000	600,000	240,000
	<u>4,300,000</u>	<u>6,550,000</u>	<u>2,620,000</u>
<b>Southern Illinois</b>	<u>1,500,000</u>	<u>4,000,000</u>	<u>1,600,000</u>
	<u>5,800,000</u>	<u>10,550,000</u>	<u>4,220,000</u>
<b>West Virginia</b>	-	2,500,000	1,000,000
<b>North Dakota</b>	-	<u>1,500,000</u>	<u>600,000</u>
<b>Total Tons</b>	<u>5,800,000</u>	<u>14,550,000</u>	<u>5,820,000</u>

United would exchange 1,580,000 tons of Midwestern tonnage for an equivalent amount of West Virginia and North Dakota tonnage.

**KOLBE DEPOSITION EXHIBIT E****REPORT ON PROPOSED MERGER****ILLINOIS OPERATIONS****TRUAX-TRAER COAL COMPANY****JANUARY 1956****THERON G. GEROW****MINING CONSULTANT AND ENGINEER****307 North Michigan Avenue  
Chicago 1, Illinois**

1588

**THERON G. GEROW**

**MINING CONSULTANT AND ENGINEER**

**307 North Michigan Avenue  
Chicago 1, Illinois**

**Telephone: FInancial 6-0288**

**January 30, 1956**

**Mr. A. H. Truax**

**President and Chairman of the Board**

**Truax-Traer Coal Company**

**111 North Wabash Avenue**

**Chicago, Illinois**

**Dear Mr. Truax:**

In this cover are my findings and estimates of the strip mining possibilities and economic opportunities in the Fulton and Perry County areas of Illinois.

I believe the report to be realistic, conservative and to present a fair estimate of operational opportunities together with indicated savings possible, based on current information.

In my opinion the operational savings possible contained in this report, together with economies indicated and apparent which should be developed from a separate tax and financial study, make the proposed merger most attractive and sound. Every effort should be made to consummate the combination.

**Yours very truly,**

**/s/ Theron G. Gerow  
THERON G. GEROW**

**TGG:cr**



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## PART I

## SUMMARY AND CONCLUSIONS

This section is presented first rather than at the end to aid in a quick digest of the report and to serve as a ready reference to the more important points of its contents.

## SUMMARY (Operational)

*Fulton County*

1. The combined Fulton County tonnage of Truax-Traer, United Electric and Little Sister was 4,040,936 tons for the 12 months period December 1, 1954 to November 30, 1955. (See Exhibit I)
2. This tonnage was processed over 4 preparation plants from 4 mining operations.
3. The combined reserves of the three companies total about 59,000,000 tons.
4. The combined potential tonnage is estimated at 76,000,000 tons or a life at the present rate of production of 19 years.
5. Unlike most mergers the reserves and operations of the three companies are extremely closely related and their reserves practically contiguous. Such a close interlocking of interests presents many opportunities for operation improvements and economies.
6. Of the combined Fulton County production 2,466,728 tons moved over the Illinois River facilities.
7. River tonnage other than from Buckheart moved at a freight disadvantage over Buckheart's cost of operating their own rail and river facilities.
8. 1954 production at Buckheart has demonstrated a potential single shift capacity at 225 operating days of 1,125,000 tons. This tonnage can be

increased either by improving daily capacity or by working more days.

9. Without question a double shift operation at Buckheart would be more economical in every way; would more than take care of the present combined river tonnage and would provide a foreseeable life of about 10 years. The mine has a reserve of approximately 25,000,000 tons.
10. Of the remaining Fulton County reserves totaling about 51,000,000 tons in the Canton-Fiatt-Cuba triangle, 11,500,000 tons lie within a 3 mile radius of the Fiatt Tipple and a total of at least 17,500,000 tons within a 4 mile radius.
11. At 1954 rates of production, Fiatt has demonstrated a production capacity of 1,460,000 tons based on 225 working days, and in the 12 month period to November 30, 1955 produced 1,503,850 tons working 235 days, almost exactly the difference between present Fulton County requirements and the Buckheart double shift capacity.
12. The Fiatt and Buckheart Tipples can produce the present Fulton County combined tonnage requirements for the next 11 to 12 years.
13. Two tipples will adequately produce the present combined Fulton County tonnage requirements. The St. David and Cuba Tipples can almost immediately be shut down.
14. The balance of the reserves or about 33,500,000 tons (Exhibit III) center on a point near the old Eagle Mine just west of Canton. In addition there are about 1,000,000 tons in the Skyrocket area which should logically be produced through the Buckheart Tipple.
15. Of the 33,500,000 tons concentrated in a block just west of Canton about 80% lie within a 2 mile radius and almost 100% including most of the Cuba reserves lie within a 3 mile radius of the proposed East Field Tipple site. More coal property is adjacent to the block and is available.

16. There is a logical location for a new tippie to handle the 83,500,000 ton reserve directly west of Canton near the T.P. & W. Railroad where a C.L. & Q. connection is also possible.
17. If a T.P. & W. rail connection is desirable or important, such a route has previously been surveyed into the Fiatt Tippie.
18. Discussion of the Cuba Tippie and other operational problems are carried in Part III—Mining Operations.
19. The opportunities and possibilities of operational advantages and economics are very apparent under merged interests of Truax-Traer, United Electric and Little Sister in the Fulton County area.
20. In addition to general merged interests there are many economies possible such as better application of the several units of stripping equipment available, the use of higher capacity trucks, double shift, etc.

#### *Perry County*

1. The combined Perry County tonnage of Truax-Traer and United Electric was 2,245,613 tons for the 12 month period December 1, 1954 to November 30, 1955. (See Exhibit I)
2. This tonnage was processed over two cleaning plants from three mining operations.
3. The combined reserves of the two companies in Perry County are 54,379,389 tons with a combined potential of at least 56,000,000 tons or a life at present rates of production of about 25 years.
4. Again, as in Fulton County, these reserves are very closely integrated, being only separated by the Illinois Central Railroad and are practically all contained within a circle of 3 miles radius centering along the I.C. tracks near William Creek.

5. The Pyramid Mine is within about a year of working out.
6. Burning Star Mine No. 2 is under a 25¢ per ton burden in shipping coal to the Pyramid Tipple for cleaning. This cost will also be added to the Pyramid tonnage unless a new tipple location becomes available promptly.
7. Truax-Traer must definitely make a decision very shortly as to a new tipple site.
8. The Fidelity Tipple has a demonstrated capacity based on 225 working days of about 1,135,000 tons. Double shift, it would more than take care of combined present tonnage requirement. However, it is a relatively high cost tipple.
9. The Fidelity Mine is now hauling on radii of 3 and 4 miles with most reserves at the 4 mile radius. It cannot reach Truax-Traer reserves under a 5 to 6 mile radius.
10. One Tipple on a double shift basis properly located can adequately process Perry County tonnage requirements.
11. It seems logical for maximum economy, operational advantages and long range planning to consider a new modern and thoroughly efficient tipple near the center of some 56,000,000 tons of coal reserves.
12. Discussion of the Perry County tipples is carried under Part III—Mining Operations.
13. There is a splendid opportunity for operational advantages and economies in merged Perry County operations of Truax-Traer and United Electric.
14. In addition to apparent economies from merged operations there are many other operational savings possible from the use of high capacity haulage units, double shift, more economical use of available stripping units, etc.

## CONCLUSIONS

1. From the Summary above and the study carried in the body of the Report there seems every reason from an operational point of view to merge the interests of Truax-Traer, United Electric and Little Sister in Fulton County, Illinois and Truax-Traer and United Electric in Perry County, Illinois.
2. Operational advantages and economies resulting will be substantial.
3. Sales advantages will provide better coverage of the market areas at considerable savings in cost of sales per ton.
4. Administration and management should be able to function more capably and efficiently at a considerable savings in cost per ton.
5. Results of merged interests, without the scope of this report, such as tax advantages, write-off of obsolete or non-profitable equipment and operations, stock values, financial factors, etc., are all very fertile fields of investigation which will produce additional savings.
6. No adverse or detrimental factors which might affect the proposed merger have come to light in this preliminary study.

## RECOMMENDATIONS

1. Merge Truax-Traer Coal Company, United Electric Coal Companies and Little Sister Coal Company.
2. In Fulton County:
  - (a) Double shift the Buckheart Mine for full production of river shipments.
  - (b) Shut down the Cuba Mine and move its stripping and loading equipment to Buckheart for added mining capacity.
  - (c) Process the Skyrocket reserves of Little Sister Coal Company over the Buckheart



Tipple. 60% of Little Sister's tonnage presently moves to the River.

(d) Shut down the St. David operations of Little Sister and make available the 40 yd. 5561 Marion stripping shovel to the Fiatt operation.

(e) Operate the Fiatt Mine full single shift capacity at about 235 working days for the balance of Fulton County tonnage requirements.

(f) Install 50 ton or larger haulage units at both Fiatt and Buckheart mines.

(g) Engineer and plan new tipple at a site directly west of Canton for production of remaining reserves, including Cuba and Little Sister, to be ready in about 10 years or sooner if production demand requires.

(h) Consider T.P. & W. rail connection to Fiatt Tipple.

(i) Consolidate and streamline all Fulton County supervision, engineering, management and administration.

### 3. In Perry County:

(a) Plan and build a centrally located tipple to handle the combined Perry County tonnage, to be ready as soon as possible.

(b) Shut down the Fidelity and Pyramid Tipples.

(c) Double shift the new tipple.

(d) Replace all haulage equipment with 50 ton or larger units for double shift service.

(e) Provide both Illinois Central and Missouri Pacific rail connections to the new tipple.

(f) Consolidate and streamline all Perry County supervision, engineering, management and administration.

4. Combine and streamline all sales, management, administration and accounting departments and functions of Truax-Traer and United Electric for maximum efficiency and economy.

5. Study, under capable direction, the possibilities under a merger of tax and financial advantages.

### ESTIMATED SAVINGS

A summary of estimated savings possible under a merger of Truax-Traer and United Electric also Little Sister in Fulton County follows. Only the effect of advantages in Fulton County and Perry County, Illinois have been considered. Details and basis of estimates are carried in Part III—Mining Operations and Part IV—Selling and Administration.

#### Estimated Savings

Fulton County Operations	\$2,022,515.00
Perry County Operations	1,178,985.00
Selling and Administration	575,240.00
Market Stability	730,000.00
<b>Total</b>	<b>\$4,506,690.00</b>

It may be well to call attention to the fact that the above total on factors covered by this report represents \$2.00 a share or more on the combined shares of stock of Truax-Traer and United Electric giving credit for the inclusion of Little Sister and perhaps some stock adjustment.

### ESTIMATED CAPITAL EXPENDITURES

A preliminary estimate of capital investments required to accomplish the above savings is as follows:

Fulton County	\$ 985,000.00
Perry County	2,453,000.00
<b>Total</b>	<b>\$3,438,000.00</b>

It should be clearly pointed out, however, that Truax-Traer is faced with an estimated expenditure of about \$2,688,000.00 in any event with only relatively minor savings resulting. Hence:

**CAPITAL EXPENDITURES  
CHARGEABLE TO MERGER—\$750,000.00**

In my opinion, based on the above study, such a merger would result in a substantial increase in both dividends and market value to stockholders of both companies due to increased efficiency of operations and substantial savings possible in practically all departments of the combined companies.

The present trend and ultimate solution to a sound and economic coal industry is fewer and larger coal companies under competent and far seeing management with a willingness to meet and solve the problems of the industry cooperatively.

Respectfully submitted,

/s/ Theron G. Gerow  
THERON G. GEROW  
Mining Consultant and  
Engineer

**PART II**

**SCOPE OF REPORT**

This report attempts to evaluate the operational advantages and economics possible under merger operations and interests of Truax-Traer Coal Company, The United Electric Coal Companies and Little Sister Coal Corporation.

Interests of the three companies are only interlocked in Illinois. The three companies are very closely related in both mining and sales in Fulton County and Truax-Traer and United Electric in Perry County.

The nearly contiguous and interlocked situation of the mining operations and coal reserves in both counties presents unusual opportunities for economics and operational savings in practically all departments of the companies, a condition not generally found in the consideration of coal mergers.

Therefore, for the purposes of this preliminary report, its scope is limited to the following:

1. The report is limited to a study of Fulton and Perry Counties, Illinois.
2. All other operations of the companies involved are separate and must stand on their own as to final value to the proposed merger.
3. For the present such separate operations can be assumed to contribute to the merged company in proportion to their present contribution to the parent company.
4. The report is based on data and information furnished by Truax-Traer, United Electric and Little Sister coal companies, and estimates where exact information was lacking.
5. The reports attempts to form a basis for the most economical consolidated operation of the several Mines involved.
6. The report attempts to point out and evaluate combined long-term possibilities, advantages and economics of operation.
7. The report does not cover any tax or financial advantages that will undoubtedly result from such a merger.
8. The report does not cover the probable effect on stock dividends or market value of stock.
9. The report only covers in a general way the effect of combined management, sales and administrative functions, giving credit chiefly to the accrued benefits resulting from merged Illinois interests.
10. The report does not attempt to make any estimates or evaluate the probable equities of the three companies in the proposed merged company.

### PART III

#### MINING OPERATIONS

Consideration of mining operations of Truax-Traer Coal Company, The United Electric Coal Companies and Little Sister Coal Corporation under a proposed merger

is limited to Fulton and Perry Counties in the State of Illinois.

Other mining operations of Truax-Traer and United Electric are, for the purposes of this report, assumed to contribute to the merged company in proportion to their present contributions to their parent companies. No major operational savings would be expected from such other operations as a result of a merger.

The situation in both Fulton and Perry Counties, Illinois is considerably different and probably unique in merger consideration. The reserves of the companies are contiguous and mining operations contained in a circle of relatively small radius in both counties. (See Exhibits III and IV).

Operating conditions, coal quality, preparation plants, equipment, methods of operation, costs, etc. are either identical or nearly so in each county.

Joint operations in Illinois naturally divide themselves for study into the Fulton County area (Exhibit III) and the Perry County area (Exhibit IV) and will be so analyzed.

### FULTON COUNTY

The combined production of the three companies in Fulton County for the 12 months prior to November 30, 1955 was 4,040,936 tons, of which 2,466,728 tons were shipped via the Illinois River over dock facilities of the companies.

The coal was produced from 4 separate operations over 4 tipples. All operations and coal reserves are contained in a circle of approximately a 9 mile radius.

Owned and leased coal reserves in this area total 59,000,000 tons and a conservative estimate of a potential reserve is 76,000,000 tons.

The Buckheart Mine of United Electric has its own rail and dock facilities for river shipments. The other mines are under a cost handicap on river shipments having to add either a Burlington handling charge to the Buckheart facilities or the established rail rate to the Liverpool Dock owned and operated by Truax-Traer.



This is important as over 60% of the combined Fulton County tonnage moves via the Illinois River.

Please refer to Exhibit III for a clearer picture of the mining situations of the several mines which follows.

#### *Fiatt Mine (Truax-Traer)*

The Fiatt Mine produced 1,603,850 tons in the 12/1/54 to 11/30/55 period and worked 235 days.

It has proven average tippie capacity of 6500 tons per shift which for 225 days of work indicates a single shift potential of 1,460,000 tons annually.

The Fiatt Mine has the best operating conditions and is the lowest cost operation in the area.

The Tipple has had recent improvements and additions which have brought its capacity up to the highest of the four tipples being considered and costs are well in line and actually slightly below United Electric's average Fulton County preparation costs.

The mine has a reserve tonnage of 20,444,339 tons, of which 11,500,000 tons of low overburden coal are within a 3 mile radius with an average radius haul of less than  $2\frac{1}{2}$  miles.

The potential tonnage adjacent to the Tipple, including Little Sister's Cuba acreage at a 4 mile average haul, will exceed 17,500,000 tons giving an indicated life of low cost coal at maximum single shift operation of about  $11\frac{1}{2}$  years.

Fiatt has already made a start on large capacity haulage trucks with six 45 ton units. A high capacity haulage fleet will materially reduce haulage costs at the mine.

To haul 6500 tons an average of 3 miles, ten 50 ton units are indicated plus two extra for repair and maintenance, making a total of 12 to replace 22 older units. Six more units will probably cost about \$300,000.00.

The balance of Fiatt's coal reserves, approximately 9,000,000 tons, lies in the so-called East Field centering at a point 5 miles air line from the Fiatt Tipple, along the T.P. & W. Railway just west of Canton



and the old Eagle Mine and within reach of the "Yard Limits" of Canton.

The East Field in addition to the 9,000,000 tons of reserves has another 9,000,000 virtually surrounded by its acreage with another 3,000,000 tons or more of adjoining potential. Hence the East Field has a potential tonnage reserve of 21,000,000 tons.

The East Field operating conditions will not be as favorable as for the tonnage adjoining the Fiatt Tipple being more nearly comparable to the St. David area of Little Sister which joins on the south and the Cuba reserves of United Electric which likewise joins Little Sister reserves to the west.

Including Little Sister's St. David area and United Electric's Cuba reserves together with other available coal, presents a picture of at least 33,500,000 tons of reserves, about 60% of which lie within a 2 mile radius circle of the location described above, about 80% within a 3 mile circle and only 20% or less requiring a 4 mile haul.

With a foreseeable cost of the East Field substantially more than Fiatt's present cost, certainly it is logical to plan for recovery of this large reserve at the lowest possible cost over new facilities including high capacity mining units and a low cost tipple favorably located.

The suggested location west of the Canton city limits can be served by both the T.P. & W. and C.B. & Q. railroads, which will probably be a requirement.

A rail connection has previously been surveyed from the T.P. & W. tracks to the Fiatt Tipple, should such a connection become desirable for the next 10 years.

#### *Cuba Mine (United Electric)*

The Cuba Mine produced 751,575 tons in the same period (12/1/54-11/30/55) working 194 days.

It has an indicated average tipple capacity of 3875

tons per shift. On a 225 day year the indicated annual shift capacity is 872,000 tons.

From available information, Cuba's tippie and preparation costs are somewhat lower than the other mines but their total operating cost is 52¢ a ton higher than at Fiatt.

The mine has a reserve of 7,430,910 tons of relatively high stripping cost coal at about a 4 mile radius haul from the tippie, which at the present rate of production would indicate a life of about 10 years.

There are no other potential reserves available to Cuba other than the Little Sister reserves. Certainly operation of either of Little Sister's reserves, through the Cuba Tippie, would tend to increase rather than decrease operating costs.

There seems no other hope of a substantial reduction in Cuba's costs other than to produce the remaining reserves over a relocated tippie designed for maximum economy and working double shift for greatest efficiency.

It seems logical to consider future operations of the Cuba reserves in conjunction with the East Field for long range planning and greatest economy.

### *Little Sister Mine*

The Little Sister Mine produced 668,319 tons in the 12 month period to 11/30/55 over the St. David Tippie working 173 days.

The indicated average tippie capacity is 3755 tons per shift which would give a maximum of 845,000 tons annually working 225 days single shift.

Coal was produced from two pits, the 550-B operating in the Skyrocket area and the 5561-M with dragline help operating the St. David area.

The Skyrocket area has about 1,100,000 tons in reserve with good pit conditions and an average radius haul of about 2 miles.

This pit should produce good costs and it seems logical to exhaust the reserves over the Buckheart

**Tipple.** A suitable underpass at the Burlington tracks and State Highway would have future value for right of way for a rail connection from the East Field to the River.

The St. David area joining the East Field of Truax-Traer has heavy pit conditions, a 4 mile radius haul and about 4,250,000 tons in reserve. It appears logical to shut this pit down and work it more economically at some future date in conjunction with the East Field.

Continuing as at present, the combined Little Sister reserves, excluding Cuba, would be exhausted in about 7 years.

#### *Buckheart Mine (United Electric)*

The Buckheart Mine produced 1,117,192 tons in the period 12/1/54 to 11/30/55 working 236 days.

It has an indicated average tipple capacity of 4734 tons per shift which at 225 single shift work days would give an annual single shift potential of 1,065,150 tons. This capacity can be improved either by better daily capacity or working more days.

From presently available figures, Buckheart is operating at a 44¢ per ton higher cost than the Fiatt Mine of Truax-Traer. (See Exhibit I).

Buckheart has rail and dock facilities for river shipments which allows the mine to enjoy about a 30¢ per ton advantage over the other Fulton County mines.

Buckheart has a reserve of 22,380,668 tons and a potential of about 25,000,000 tons of relatively high stripping cost coal, most of it lying within a 4 mile radius haul with the average about 3½ miles straight line from the tipple. At present rates of production this reserve will last about 21 years.

The Buckheart Tipple has had recent improvements added. On a double shift basis, it should produce upwards of 2,400,000 tons which is approximately the combined River tonnage requirement of the three companies.

With an average pit haul of about 4 miles and a shift capacity of 4734 tons, 9 or 10 coal haulers of 50 tons capacity would be required. It would cost about \$600,000.00 to modernize the truck fleet.

## FULTON COUNTY CONCLUSIONS AND RECOMMENDATIONS

### *Conclusions*

1. There is an unusual opportunity for substantial economic savings as well as physical operating benefits to be derived from a merger of Truax-Traer, United Electric and Little Sister in Fulton County.
2. The combined tonnage of 4,040,936 tons can within a short period of time be comfortably produced over 2 tipples.
3. It would seem entirely possible to bring the Buckheart Tipple up to 5000 tons capacity per shift, if not, more days can be worked all on a double shift basis to produce the 2,500,000 tons required for river shipments.
4. The Cuba stripping equipment should provide the necessary extra strip coal at Buckheart.
5. The Fiatt potential capacity of over 1,500,000 tons on single shift working 235 days almost exactly produces the balance of the Fulton County present requirements. (See Exhibit II). It is possible to work more days for added production.
6. With a total of 76,000,000 tons potential reserve in Fulton County, it becomes highly important to practice the most efficient operating procedures possible together with careful marketing. A fluctuation of 10¢ per ton on either sales realization or operating cost means a gain or loss of \$7,600,000 in value.
7. The East Field should be carefully developed for maximum economy in operating costs and market conformity.

8. There are substantial savings to be realized in combined supervision, engineering and administration in Fulton County.

#### *Recommendations*

1. Merge the operations and interests of Truax-Traer Coal Company, The United Electric Coal Companies and Little Sister Coal Corporation in Fulton County.
2. Shut down the Cuba Mine and move its stripping equipment to Buckheart.
3. Shut down Little Sister's St. David area and make its stripping equipment available to Fiatt. Process the Skyrocket area coal over the Buckheart Tipple.
4. Double shift and improve capacity and mine costs at Buckheart for full production of River Coal.
5. Operate the Fiatt Mine for full single shift capacity of Fulton County rail requirements.
6. Put in T.P. & W. rail connection to Fiatt if required.
7. Plan a new tipple and site for the mining of the East Field to be ready to replace Fiatt in approximately 10 years, or earlier if market conditions warrant.
8. Modernize and improve costs wherever it is economically possible.
9. Consolidate Fulton County supervision, engineering and administration for best efficiency and economy.

#### **ESTIMATED FULTON COUNTY SAVINGS**

##### **1. Shut Down the Cuba Mine.**

About 86,000 tons of Cuba production moved via Buckheart and the River. This tonnage would be supplied by Buckheart.

Present Buckheart costs are 8¢ a ton lower than Cuba. (Exhibit I).

\$ .08 x 86,000

\$ 6,880.00



A transportation item amounting to \$1.03 was charged against Cuba River coal (excluding normal Buckheart River costs).

\$1.03 x 86,000

\$ 88,775.00

The balance of Cuba's production or about 665,500 tons of all rail coal will be supplied from Fiatt at a 52¢ lower operating cost.

\$ .52 x 665,500

\$346,060.00

Cuba's tipple, track and haulage road maintenance runs over \$175,000.00 a year. Assume 40% transferred to Buckheart for second shift operation. 60% of the cost would be saved.

.60 x \$175,000.00

\$105,000.00

Mine office salaries, supervisory, engineering and general overhead run upwards of \$150,000 annually. Assume 35% transferred to Buckheart to handle second shift. 65% would be saved.

.65 x \$150,000.00

\$ 97,500.00

Total Savings

\$644,215.00

## 2. Double Shift Buckheart Mine.

A full double shift operation at Buckheart to produce approximately 2,500,000 tons of River Coal will materially reduce operating costs.

Using Fiatt's unit stripping costs at a 9.26 ratio applied to a 11.57 ratio at Buckheart the stripping cost should average 71.2¢. Allowing a cost of 75¢ against Buckheart's present cost of 90¢. Saving per ton.

\$ .15

Preparation costs at Buckheart of 42¢ per ton are the highest studied. With the double shift operation and the added maintenance allowance from Cuba above, the cost should be reduced to about 30¢. However, allow 32¢ or a 10¢ per ton savings.

.10

Haulage costs are relatively good at Buckheart but on a double shift basis with 50 ton units the cost will be reduced at least 5¢ per ton

.05



With the overhead allowance from Cuba and the twice as large divisor due to increased production from double shift production, all general overhead items will be reduced at least 10¢ per ton

.10

Total per ton savings \$ .40

Such a savings would reduce Buckheart's present cost of \$2.77 to \$2.37 which is more nearly in line with Fiatt's operating cost of \$2.33. Actually on a two shift basis and in spite of a heavier overburden ratio Buckheart should operate more cheaply than Fiatt, with approximately 1,000,000 tons more production.

The 40¢ a ton savings will apply on present Buckheart production of 1,117,192 tons plus the 86,000 tons of river coal from Cuba or a total of about 1,200,000 tons.

$\$.40 \times 1,200,000$  \$480,000.00

### 3. Shut Down Little Sister Operations.

Of Little Sister's production, 390,000 tons of River coal will be produced at Buckheart at an estimated cost of \$2.37 against present costs of \$2.44 or 7¢ a ton savings.

$\$.07 \times 390,000$  \$ 27,300.00

The balance or about 280,000 tons of all rail coal will be produced at Fiatt at an 11¢ lower cost.

$\$.11 \times 280,000$  \$ 30,800.00

All general office administration and about 10¢ per ton of general overhead will be eliminated:

General office administration \$166,000.00

10¢  $\times$  668,000 general overhead 66,800.00

\$232,800.00

Total Little Sister \$290,900.00

#### 4. Operate Fiatt Mine Full Capacity.

There is little opportunity for any large savings at Fiatt. The mine now has the lowest cost in the field.

The largest single item of combined savings will be noted under "River Shipments" below.

Haulage costs are high at Fiatt using 20 and 25 ton coal haulers. The full use of a high capacity fleet will reduce costs at least 10¢ per ton. 40 ton units at Fidelity are hauling for 20¢.

$\$.10 \times 1,500,000$

\$150,000.00

A benefit of 10¢ per ton will accrue on about 700,000 tons of production with the use of one of the large stripping units replacing the 750-B shovel.

$\$.10 \times 700,000$

\$ 70,000.00

Total Fiatt

\$220,000.00

#### 5. River Shipments.

The Buckheart Mine which is scheduled to produce all Fulton County River coal reaches barges on the Illinois River at 20¢ per ton. On an expanded double shift basis this figure should improve.

Truax-Traer's River Terminal at Liverpool operates for 11¢ per ton and the rail rate to the river is 40¢ or a total of 51¢ to reach barges from either Little Sister or Fiatt.

Hence a savings of 31¢ a ton will be realized by making these shipments from Buckheart:

Little Sister	391,045 tons
Fiatt Mine	900,309

Total

1,291,345 tons

Use 30¢ savings—

$\$.30 \times 1,291,345$

\$387,400.00

#### RE-CAP FULTON COUNTY SAVINGS

1. Shut down Cuba Mine	\$ 644,215.00
2. Double shift Buckheart Mine	480,000.00
3. Shut down Little Sister Operations	290,900.00
4. Operate Fiatt full capacity	22,000.00
5. River shipments	387,400.00
	<hr/>
	\$2,022,515.00

## PERRY COUNTY

The Elkville mines of Truax-Traer, Burning Star Drift (underground) and Burning Star No. 1 (strip) in Jackson County, although operating in the general vicinity of the Perry County mines, are too far distant to be considered for any economic operational savings from a merger.

The Strip mine has reserves of 6,672,149 tons, sufficient to carry it about 12 years at its present rate of production of 564,000 tons. The Drift has reserves for about 27 years.

It is, therefore, logical to consider their operation separately and assume the contribution to the merged company in proportion to the contribution to the parent company—Truax-Traer.

The Perry County mines of Truax-Traer and United Electric produced 2,245,613 tons in the 12 month period December 1, 1954 through November 30, 1955.

The coal was produced over 2 tipples and mined from 3 general operations, Fidelity, Burning Star No. 2 and Pyramid, the tipples being at Fidelity and Pyramid.

The reserves of the two companies total 54,379,389 tons with a potential of 56,000,000 tons all lying within a circle of 3 miles radius centering along the Illinois Central tracks (which divides Truax-Traer and United Electric) near William Creek.

About 30% of the reserve tonnage lies within this same circle at a 2 mile radius.

See Exhibit IV for a clearer picture of reserves and mining operations.

### *Pyramid Mine (Truax-Traer)*

The Pyramid Mine is operating on property adjacent to the Pyramid Tipple. Pyramid has a small reserve of coal, which will be exhausted at the present rate of production in less than two years.

The Stripping unit is an 1150-B Dragline which normally will be moved to Burning Star No. 2 mine in a short time.

Burning Star No. 2 is now shipping coal to the Pyramid Tipple for preparation at about a 25¢ per ton penalty.

A prompt decision must be made as to a new tipple and tipple site to be ready to operate not later than the Fall of 1957.

*Burning Star No. 2 Mine (Truax-Traer)*

Burning Star No. 2 and Pyramid combined produced in the 12 month period 1,167,066 tons.

Burning Star No. 2 is presently shipping its tonnage to the Pyramid Cleaning Plant at a freight and dumping charge of 25¢ per ton. In spite of this handicap it is producing coal at a considerably less cost than the other two mines.

The mine has a coal reserve of 30,685,842 tons with a potential reserve exceeding 32,000,000 tons giving a life of over 27 years at present rates of combined production. (Pyramid and Burning Star No. 2).

Pyramid and Burning Star No. 2 are operating with a total of 17 coal trucks. A savings can be realized on a combined operation with the use of 50 ton coal haulers.

The primary stripping unit at Burning Star No. 2 is a 950-B stripping shovel.

*Fidelity Mine (United Electric)*

The Fidelity Mine produced 1,078,547 tons in the 12 month period (12/1/54 to 11/30/55) working 217 days.

The indicated tipple capacity is 4970 tons per shift which gives a potential annual production, working 225 days, of 1,118,250 tons.

The Fidelity Tipple is probably one of the oldest in the area but has been improved. Its present operating cost is 34¢ or 8¢ a ton higher than the Pyramid Tipple cost.

Haulage costs are good, both at Fidelity and Burning Star No. 2, when compared with Fulton County costs.

Fidelity's operating costs are 50¢ a ton higher than the combined Pyramid and Burning Star No. 2 costs.

The Fidelity Mine has a reserve tonnage of 23,693,547 tons with a potential of about 24,000,000 tons. Practically all of this reserve lies at a greater distance from the present tippie than the present haul of  $3\frac{1}{2}$  and  $4\frac{1}{2}$  miles. It takes a 5 mile radius to include all the reserves.

The stripping units at this mine are a 45 cu.yd. Shovel, a 35 cu.yd. Dragline and a recently added Wheel Excavator. Sixteen 40 ton coal trucks are used for haulage.

#### Perry County Conclusions

1. There is an excellent opportunity for operational savings and advantages in merged interests of Truax-Traer and United Electric in Perry County.
2. Truax-Traer is faced with an immediate decision and capital expenditures for a new tippie and tippie location.
3. Present Truax-Traer operations are substantially cheaper (50¢ per ton) in Perry County than United Electric.
4. The Fidelity Mine is faced with increasing costs due to gradually increasing haulage distances.
5. Combined production requirements can be handled comfortably through a double shift tippie of 3000 tons capacity per shift.
6. A modern tippie, streamlined for present and indicated future market requirements can prepare the coal cheaper than present tipples.
7. Haulage can be improved and shortened on a combined total reserve of over 56,000,000 tons.
8. With a reserve of this magnitude every effort must be made for economical operations, sales, administration, etc. Every fluctuation or change in either cost per ton or realization of

10¢ per ton means a change of \$5,600,000.00 in value.

9. There are substantial savings to be realized from combined supervision, engineering, clerical and administration in Perry County.

### *Recommendations*

1. Immediately engineer and plan a new tippie of about 5000 tons capacity per shift, located near the center of the combined 56,000,000 ton reserve.
2. Connect with both the Illinois Central and Missouri Pacific railroads.
3. Shut down both the Fidelity and Pyramid Tipples.
4. Move the Pyramid 1150-B to Burning Star No. 2.
5. Modernize all haulage equipment.
6. Centralize all operational functions.
7. Combine supervision, engineering, clerical and administration.
8. And, outside the scope of this report, conceive some scheme of economically reaching the river for an added outlet of production.

### **ESTIMATED PERRY COUNTY SAVINGS**

#### **1. Central Modern Tipple**

A fully modern efficient plant streamlined for present day preparation demands without heat drying should produce coal for less than 20¢ per ton. Dual shifting will further reduce the cost per ton. A conservative figure would be about 18¢ per ton.

The new tippie would, therefore, save 8¢ per ton on Pyramid's cost of 26¢ and 16¢ per ton on Fidelity's cost of 34¢.

\$ .08 x 1,167,066

\$ 93,565.00

\$ .16 x 1,078,547

\$172,565.00



The Central Tipple will eliminate the 25¢ shipping and handling charge from Burning Star No. 2 to the Pyramid Tipple. The tonnage will include Pyramid's tonnage in about a year's time.

$$.25 \times 1,167,066$	\$321,765.00
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Maintenance is running upwards of \$180,000 a year at Fidelity on tipple and yard tracks, with Pyramid about the same.

A new modern tipple and yard will maintain for that figure, hence saving the full item.	\$180,000.00
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Total Tipple	<u>\$737,695.00</u>
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## 2. Modernize Haulage Equipment

The installation of 50 ton haulage units to replace the present 20 and 35 ton units at Pyramid and Burning Star will reduce haulage costs about 5¢ a ton on the present 18¢ cost. The resulting figure of 13¢ can be taken for the combined tonnage of both companies over a short haul to the new Central Tipple.

Although Fidelity is now using 40 ton units their cost is 8¢ a ton higher than at Pyramid and Burning Star No. 2. A shorter haul and modern units will correct the cost. Hence, the savings will be:

(.18-.13) \$.05 x 1,167,066	\$ 58,350.00
(.20-.13) \$.07 x 1,078,547	\$ 75,500.00

Total Haulage	<u>\$133,850.00</u>
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## 3. Centralize Operating Facilities

Central facilities and combined administration, supervision, engineering and general overhead will result in substantial savings.

A central shop and repair facilities will conservatively save	\$ 75,000.00
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General overhead, supervision, etc., are running upwards of \$175,000.00 at Fidelity and about the same at the Truax mines. 65% of one of the operations can be saved, transferring 35% of .65 x 175,000.00	\$113,750.00
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the expense to the combined operation.

Total Centralization	<u>\$188,750.00</u>
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#### 4. Stripping

There is entirely too much spread between Burning Star No. 2 stripping costs of 64¢ and Fidelity's cost at \$1.01. United Electric has forecast a possible 75¢ cost at Fidelity. However, using Burning Star's unit cost at 7 to 1 ratio against a ratio of 10 to 1 at Fidelity, the cost should be about 90¢ on a comparable basis. Hence there should be at least a 11¢ savings on 1,078,547 tons

\$118,640.00

#### 5. Re-Cap Perry County Savings

1. Central modern tippie	\$ 737,695.00
2. Modernize haulage equipment	133,850.00
3. Centralize operating facilities	188,750.00
4. Stripping	118,640.00

Total Perry County \$1,178,935.00

#### RE-CAP FULTON AND PERRY COUNTY SAVINGS

Total Fulton County	\$2,022,515.00
Total Perry County	<u>1,178,935.00</u>
Total Illinois Operational Savings	\$3,201,450.00

### PART IV

#### SELLING AND ADMINISTRATION

##### *Selling*

Both companies maintain sales coverage of the market areas served by Illinois coals. There is a complete duplication not only of expense but of sales effort.

Such sales efforts conscientiously and diligently pursued have an adverse effect on market prices.

Principal markets for Illinois coals are the industrial and utility demands. Supplying such customers usually runs to rather large contracts carrying a uniform shipping schedule. It is a distinct advantage to both the customer and supplier to have a large backlog of reserves as well as to have several mines able to back up shipping schedules in the event of mishap or forced shut down of any one operation.

Further, operating as separate companies, there is undoubtedly considerable sub-standard business taken in order to fill out operational tonnage volume. This has an adverse effect on realization even though operating costs may be maintained. Merged operations would eliminate to a large extent the necessity of booking such business unless economically sound.

Sales, policies, advertising and administration can all be consolidated with definite dollar savings, at the same time giving more effective and efficient service and coverage to customers.

It would be difficult without a detailed study of both companies' sales organizations, their outlying offices and a study of an organization chart for merged sales coverage, to more than estimate in a general way the indicated savings possible.

#### *Administrative*

Both companies maintain almost parallel administrative, financial and clerical staffs. It is safe to say that with modest additions to either organization the combined work load can be efficiently handled.

In a combination of forces the most competent talent and best practices of both companies can be used for the benefit of the merged company.

Indicated reductions and payroll savings will not all be possible promptly due to personnel of long service on or due soon for pension benefits. However, over a period of time the indicated economies will adjust.

#### *Financial*

Without question, as in previous mergers or consolidations, there will be many opportunities for tax savings, write-offs and more efficient use of funds and credit.

No attempt will be made to estimate such benefits as it is a separate study requiring full and complete information.

*Estimated Savings**1. Sales and Administration*

The United Electric's "Selling, General and Administrative Expenses" for the year ending November 30, 1955, totalled \$1,020,081.00 for 3,375,529 tons of production or 30¢ per ton.

Truax-Traer's cost for the same period was \$1,733,659.00 for 7,516,857 tons of production or 23¢ per ton.

The combined tonnage of the two companies was 10,892,386 tons and the combined cost was \$2,753,740.00.

Allowing for about 40% or \$400,000.00 of United Electric's cost to be added to the Truax cost to handle the combined tonnage, a total of \$2,133,659.00 would result or 19.6¢ per ton. Use conservatively 20¢.

Present total cost	\$2,753,740.00
20¢ x 10,892,386	2,178,500.00

Savings

\$575,240.00

*2. Market Stability*

The combined sales effort and advantages will result in an increase in realization over a relatively short period.

In addition elimination of the necessity of bookkeeping sub-standard business will substantially improve realization.

Both factors will conservatively increase realization over a short period of time by at least 10¢ per ton. With a combined Illinois tonnage of over 7,300,000 tons the resultant savings will be at least

\$ 730,000.00

*Total Estimated Sales, Administration  
and General Savings*

\$1,305,240.00

*Estimated Total Savings (Operating, Sales,  
Administration)*

From Combined Illinois Operations	\$3,201,450.00
From Combined Sales, Administration, etc.	1,305,240.00
<b>Total</b>	<u><u>\$4,506,690.00</u></u>

## PART V

## CAPITAL EXPENDITURES

From the foregoing report, considerable operating savings are indicated from the merger being considered.

Certain capital investments will necessarily have to be made to accomplish the results forecast.

Although no detailed engineering studies have been made, it is possible to give an approximate idea of expected expenditures and it seems logical to include such an estimate at this time. It will be understood that any estimates made will be subject to correction as more definite engineering information is obtained.

*Estimate of Major Expenditures Required**Fulton County*1. *Move Cuba Shovel and Wheel Excavator to Buckheart.*

The airline distance between the Cuba and Buckheart Pits is about 7 miles—allow 9 miles travel.

Most of the distance will be over jointly owned property. Little Sister haulage roads may be of great help in selecting a route and speeding up the move. The C. B. & Q. tracks and Highway 73 will be a critical crossing.

Very little additional right of way will be required. All calculations have been made separately and not included in the report. The work sheets are available if required.

	<u>Operating Expense</u>	<u>Capital</u>
Estimated cost	\$ 75,000.00	
Move other required equipment	10,000.00	
(Operating Expense)	\$ 85,000.00	

2. *Double Shift Buckheart Mine*

Several miles of main haulage road will be required for opening a new pit. Allow (Operating Exp.)

\$ 30,000.00

	<u>Operating Expense</u>	<u>Capital</u>
New main power lines will have to be established. Considerable line material and transformers can be salvaged from Cuba.		
Allow (Capital Expense)		\$ 25,000.00
Present tippie capacity is indicated at 4734 tons per shift. The tippie should produce 5500 tons per shift.		
Increased capacity would be preferable over a tight operating schedule. Allow for increasing capacity (Capital Expense)		
		300,000.00
For an average main haul of 3 miles, 9 trucks of 50 tons capacity will just about haul 5500 tons per shift. Allow 2 trucks for maintenance and repair. 11 fifty ton coal haulers would be quite safe at about \$50,000.00 each.		
Allow—\$550,000.00		
Estimated salvage from 27 trucks now being used at the two mines of an average of \$6,500.00 each or about:		
Credit — \$175,000.00		
Net cost new fleet (Capital expense)		375,000.00
The River Dock will probably need some improvements for capacity, economy and double shift operation. Allow \$50,000.00 or about the cost of extending the railroad to the Truax Dock (Capital Expense)		
		50,000.00
<b>3. Fiatt Mine</b>		
Improve haulage equipment. Fiatt now has 6 new 45 ton caterpillar coal haulers. To haul up to 7000 tons per shift, 11 trucks will be required. Allow 2 for repair and maintenance gives a total of 13 or 7 more to be acquired.		
7 at \$50,000.00 — \$350,000.00		
Fiatt now has 7 — 25 ton units and 15 — 20 units. Allow salvage of —		
15 - 20 ton at \$ 3,000 — \$ 45,000.00		
7 - 25 ton at \$10,000 — 70,000.00		
	\$115,000.00	
Net new truck fleet (Capital Expense)		\$235,000.00



	<u>Operating Expense</u>	<u>Capital</u>
Utilize Little Sister's 5561—40 cu. yd. shovel. Will require a move of either 5561 to north field or 5561 to 950-B pit and 950-B move to north field. In either case dead-head distance of about 5 miles entirely over owned property. Critical crossings are T. P. & W. Railway and Highway No. 9.		
Estimated cost of moves (Operating Expense)	\$ 25,000.00	
<i>Total Fulton County Operation, Expense</i>	<i>\$140,000.00</i>	
<i>Total Fulton County Capital Expense</i>		<i>\$985,000.00</i>

In addition, about 8 years from now a new tipple will have to be built near the old Eagle Mine west of Canton. It will probably require \$1,800,000.00 to \$2,000,000.00. However, such a new tipple would be required in any event.

#### *Perry County*

##### *Central Tipple Double Shift.*

Estimated cost of a modern 5000-6000 ton per shift tipple streamlined for utility and industrial markets.

(Capital Expense)	\$1,800,000.00
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About 5 to 6 miles of yard track and connecting spurs.

(Capital Expense)	250,000.00
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Centrally located shop and other facilities—salvaging from present operations.

(Capital Expense)	150,000.00
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New main line haulage roads.

(Operating Expense)	\$40,000.00
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Modernize truck fleet — 10 units at \$50,000.00	\$500,000.00
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##### *Salvage—*

Fidelity 15-40 ton units at \$10,000.00	\$150,000.00
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Pyramid & Burning Star No. 2—9-20 ton units at \$3000.00	27,000.00
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7-25 ton units at 10,000.00	70,000.00
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<b>Total Salvage</b>	<b>\$247,000.00</b>
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	<u>Operating Expense</u>	<u>Capital</u>
Net Total New Truck Fleet (Capital Expense)		\$ 253,000.00
Move 1150-B to Burning Star No. 2. This will be done over about a 5 mile route pre- viously used.		
Estimated Cost (Operating Expense)	\$ 18,000.00	
Total Perry County Operating Expense	\$ 58,000.00	
Total Perry County Capital Expense		\$2,453,000.00

**RE-CAP CAPITAL EXPENDITURES FULTON AND  
PERRY COUNTIES**

Fulton County	\$140,000.00	\$ 985,000.00
Perry County	58,000.00	2,453,000.00
Totals	\$198,000.00	\$3,438,000.00

Against this figure will be salvage of the Pyramid, Fidelity and Cuba Tipples; also St. David Tipple of Little Sister in about 2 years. Such salvage will reduce the capital investment to a figure below \$3,000,000.

This means that the investment will be amortized in less than one year by the estimated saving.

Set up as a depreciation, it will average less than \$300,000.00 a year or approximately 6.7% of the savings forecast.

Of the above total capital expenditure, Truax-Traer would normally be required to make the following investments in any event:

**Fiatt**

New trucks \$ 235,000.00

**Perry County**

New Tipple	1,800,000.00
New trackage	150,000.00
Central Facilities	100,000.00
Truck Fleet for Single Shift	
Cost \$500,000	
Salvage 97,000	403,000.00
Total	\$2,688,000.00

	<u>Operating Expense</u>	<u>Capital</u>
Hence to the merged companies the additional capital investment would be:		
Merged Capital Investment		
Estimated	\$3,438,000.00	
Truax-Traer Investment		
Estimated	2,688,000.00	
Difference	\$ 750,000.00	

Salvage of the three tipples would just about wipe out the difference.

PART VI  
EXHIBITS

	12 Months Production Tons	River Tonnage	Days Worked	Average Per Day Tons	Per Cent of Running Time 225 Days Base	Potential Tippie Capacity @ 225 Days
<i>Fulton County</i>						
<i>Truax-Traer</i>						
Flatt Mine	1,503,850	900,309	235	6,400	104.4	1,440,000
<i>United Electric</i>						
Cuba Mine	751,575	86,190	194	3,875	86.2	871,875
Buckheart	1,117,192	1,089,184	236	4,734	104.9	1,065,150
Total	1,868,767					1,937,025
<i>Little Sister</i>						
St. David	668,319	391,045	173	3,755	79.1	844,875
Cuba						
<i>Total Fulton County</i>	<u>4,040,936</u>	<u>2,466,723</u>		<u>18,764</u>		<u>4,221,900</u>
<i>Perry County</i>						
<i>Truax-Traer</i>						
Burning Star #2 & Pyramld	1,167,066		192	6,080	85.0	1,367,550

<i>United Electric</i>					
<i>Fidelity</i>	<u>1,078,547</u>			96.4	<u>1,118,250</u>
<i>Total Perry County</i>	<u>2,245,613</u>		217	<u>4,970</u>	<u>2,485,800</u>
<i>Total Perry and</i>					
<i>Fulton Counties</i>					
<i>Truax-Truer</i>		2,870,916			
<i>United Electric</i>		2,947,311			
<i>Little Sister</i>		688,319			
<i>Total</i>		<u>6,286,549</u>			

**SUMMARY—ILLINOIS PROPERTIES  
AS OF NOVEMBER 30, 1955**

Reserves		Potential Life @ Present Rate Prod.	Haulage Cost	Preparation Cost
Owned or Leased Tons	Potential Tons			
20,444,339	32,000,000	21 yrs.	(.28)	(.37)
7,430,910	7,500,000	10 yrs.	(.24)	(.33)
22,380,668	25,000,000	21 yrs.	(.17)	(.42)
5,353,780	5,500,000	17 yrs.		
3,500,000	6,000,000	—		
8,853,780	11,500,000			
59,109,697	76,000,000	19 yrs.		
30,685,842	32,000,000	27 yrs.	(.18)	(.26)
23,693,547	24,000,000	24 yrs.	(.20)	(.34)
54,379,389	56,000,000	25 yrs.		

## EXHIBIT I

## Costs

Direct Labor	Direct Supplies	Other	Total Labor & Supplies	Depreciation & Depletion	Other Overhead	Total
\$ .82	\$ .66	\$ —	\$1.48	\$ .27	\$ .58	\$2.33
.87	.84	.27	1.98	.26	.61	2.85
.89	.87	.04	1.80	.30	.67	2.77
.91	.69	.20	1.80	.24	.40(2)	2.44(1)
.84	.63	.15	1.62	.19	.60	2.41
.89	.95	.04	1.88	.42	.61	2.91

(1) Royalties (advance) of 31 cents to be added.

(2) Administration at Chicago 24 cents.



	PRESENT			PRODUCTION		PROPOSED
	12/1/34 - 11/30/35	Reserves	Production	Potential Res.		
<u>FULTON COUNTY</u>						
<u>FIATT MINE</u>	1,503,650	11,500,000 (21,000,000) West Canton	1,500,000	17,500,000		
<u>CUBA MINE</u>	751,575	7,430,910	Shut Down			
<u>BUCKHEART MINE</u>	1,117,192	22,380,640	2,500,000	25,000,000		
<u>LITTLE SISTER</u>			Shut Down			
<u>ST. DAVID</u>	650,319	5,353,780				
<u>CUBA</u>						
<u>WEST CANTON</u>			4,000,000	33,500,000		
<u>(PROPOSED)</u>						
<u>NORTH CANTON</u>						
<u>(Possible)</u>						
<u>PERRY COUNTY</u>						
<u>PYRAMID AND</u>						
<u>BURNING STAR No.2</u>	1,167,066	30,685,842				
<u>FIDELITY</u>	1,078,547	23,693,547				
<u>CENTRAL TIPPLE</u>			2,250,000	56,000,000		
<u>(PROPOSED)</u>						
						10/2

# MINING SCHEDULES

**OPERATIONS**

Year	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968
1955	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968

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## KOLBE DEPOSITION EXHIBIT L

## THE UNITED ELECTRIC COAL COMPANIES

307 North Michigan Avenue  
Chicago 1, Illinois

September 12, 1960

Mr. Frank Nugent, President  
Freeman Coal Mining Corporation  
300 West Washington Street  
Chicago 6, Illinois

Dear Frank:

Enclosed is copy of letter from Roy Miller of Alcoa which I thought you would like to see.

In line with our recent discussion, it appears worth while to make a study of possible investment and cost per ton that might be achieved in an underground mine on the coal acreage that has been acquired by the Aluminum Company.

There is, of course, no hurry about this but whenever you would like to do it, please let us know what information is needed and we will supply it.

With kindest regards,

Yours very truly,

/s/ Johnnie

JMM:EW

## KOLBE DEPOSITION EXHIBIT N

October 3, 1955

Mr. R. J. Hepburn:

In regard to the North Canton Field, I have a date today with Mrs. Lillian Miller who owns 220 acres adjoining our Lynch property and her attorney and I are hopeful of winding this up fairly soon.

Three properties that we need to drill in this area are the Miller 220, Williams 231 and Houston 256 as this is where we are meeting strong competition from Ayrshire. Mrs. Williams, if she deals with anyone, will deal with us, and Don Houston, the President of the bank in Canton, is interested only in a trade and will give us an opportunity before he will Ayrshire. This will run into money and if we can keep Ayrshire from getting it I think for the time being I think we should let it remain in that state. The other properties in the vicinity are owned by Mrs. Biddie Ingersoll who at present will deal with neither of us on any portion of her 1000 acres and Mr. and Mrs. Fred Strawn, who own 320 acres that we need to drill, are about 75 years of age and will deal with no one at all but Mrs. Strawn has talked with her heirs and told them they should let us have it after they come into possession.

These tracts are in the eastern part of our North Canton Field and it is only here that we have had opposition. The west area, in which we own or control 868 acres, has had no competition. There are, however, several hundred acres that should be picked up but this will be a matter of attrition as none of the land owners want to sell at any price. We have been attempting to deal with these people for several years and it is a time consuming process. William Blakely, who is now retired and previously operated the Blakely Coal Company and was in the mining business for many years, lives on the hard road north of Canton right on the edge of the west part of our field. He is financially independent but wants some-



thing to do to occupy his time. He has done me several favors in the past out there and would like to work for us taking up options. I think this could be arranged either on a salary or a commission basis, and I believe he would be a valuable man to have. He knows every piece of coal in the county and is very well acquainted with and respected by the land owners and I would like to have you meet him and talk over the proposition. We have lost heavily in the past to competitors in Fulton County and it shouldn't happen again.

T. H. LATIMER

THL:ga

KOLBE DEPOSITION  
EXHIBIT O

Kolbe Dep. Ex. O Id.

February 16, 1960

1056  
1056  
1056

Mr. R. J. Hepburn:

NORTH CROWN FIELD

During the past few weeks the following have been approached more than once.

1. Hegley, Marion - Don,	N <sup>1</sup> and S <sup>2</sup> SE <sup>1</sup> ,	S-e. - 13-7-3,	240 Ac.
2. Fingel, Carl G.,	SE,	Sec. - 11-7-3,	100 Ac.
3. Fingel, Elizabeth M.,	N <sup>2</sup> NE,	Sec. - 14-7-3,	80 Ac.
4. Martetirn, Emma,	SW <sup>1</sup> ,	Sec. - 11-7-3,	160 Ac.
5. Dodson, O.Y.,	ft. SE	Sec. - 10-7-3,	163 Ac.
	ft. NE,	Sec. - 15-7-3,	163 Ac.
6. Shelby, Floyd,	N <sup>2</sup> ,	Sec. - 10-7-3,	320 Ac.
7. Garrison, Roland,	N <sup>2</sup> SE	Sec. - 12	
	N 50 Ac. NE,	Sec. - 13-7-3,	130 Ac.
8. Damp, C.A.,	ft. SW,	Sec. - 13-7-3,	135 Ac.
9. Randolph, L.Y.,	SE & ft. SW	Sec. - 13-7-3,	
	N <sup>1</sup> ,	Sec. - 12-7-4,	338 Ac.
10. Miller, Viola, Geo., & Harry,	SW	Sec. - 6	
	N 70 Ac.	Sec. - 7	
	NE,	Sec. - 10-7-4,	390 Ac.
11. Wilson, Glenn, Trustee,	N <sup>2</sup> /4 & S <sup>2</sup> SW	Sec. - 8	
	N <sup>2</sup> SW	Sec. - 8	
	N <sup>2</sup> NE	Sec. - 17	
	N <sup>2</sup> SW,	Sec. - 17-7-4	440 Ac.
12. Morrell, Hattie & Lee,	SE SW	Sec. - 17	
	N <sup>2</sup> NE	Sec. - 21	
	S <sup>2</sup> NE	Sec. - 21-7-4	
	SE	Sec. - 21-8-4	
	ft. N <sup>2</sup> ,	Sec. - 20-8-4	494 Ac.

Mr. H. J. Neplurn, Capt., Feb. 16, 1960

Page 2

13. Kline, John F., Est.	E <sup>2</sup> NE S <sup>2</sup> NW NE SW	Sec. - 17 Sec. - 16-7-4	200 Ac.
14. Briggs, Byron,	N <sup>2</sup> NE V <sup>2</sup> V <sup>2</sup> V <sup>2</sup> NW	Sec. - 21-7-4 Sec. - 25 Sec. - 26-8-3	318 Ac.
15. Alward, Est.,	SW A Pt. SE E <sup>2</sup> NE	Sec. - 9 Sec. - 16-7-4	206 Ac.
16. Wolf, Floyd,	E <sup>2</sup>	Sec. - 4-7-4	328 Ac.
17. Wolf, Warren,	SW NW NE	Sec. - 4 Sec. - 9 Sec. - 7	480 Ac.
18. Martin, Blanche J.,	SE SE V <sup>2</sup> SW A Pt. S <sup>2</sup> SE SW	Sec. - 16 Sec. - 15-7-4	168 Ac.
19. Negley, Raymond,	V <sup>2</sup> NE, NW SE,	Sec. - 6-7-4	120 Ac.
20. Latimer, Harold,	V <sup>2</sup> NE V <sup>2</sup> SE	Sec. - 1-7-3 Sec. - 36-8-3	160 Ac.
21. Negley, Ben, Est.,	NW	Sec. - 1-7-3	160 Ac.
22. Eshelman, Clyde,	V <sup>2</sup> NE S 7/4 Ac. NW SE V <sup>2</sup> V <sup>2</sup> NE & NE SE E <sup>2</sup> SE	Sec. - 1-7-3 Sec. - 6-7-4 Sec. - 6-7-4 Sec. - 36-8-3 Sec. - 22-8-4 Sec. - 29-8-4	664 Ac.
23. Meyers, Fred K.,	SE 1/4 SE NW	Sec. - 32-8-4 Sec. - 4-7-4	268 Ac.
24. Rubin, Gus,	NE	Sec. - 36-8-4	160 Ac.
25. Jones, Ray, et al,	N 200 Ac. E <sup>2</sup>	Sec. - 26-8-4	160 Ac.
TOTAL			6305 Ac.

As you know we have competition in all of this area, from one source, and in the north are from two. Most of these people are sensible to talking, for two reasons; they know that if they have strikeable coal they are going to have to sell eventually, and to meet the price appeals during this time of low farm income.

Mr. R. J. Hapburn, Co., Feb. 10, 1960.

Page 3

While we have too little definite information as to the reserves in the area, there is undoubtedly enough to keep a mine going for many years to come. No. 6 coal, we know is present over much of it, and No. 6 should be present in a larger part. Depth remains to be ascertained. There are a total of about 18,000 acres in the area under discussion. Should one third contain coal at 5,000 tons per acre this would yield 30,000,000 tons, and it could be greater.

Pennsylv., Truro-Truro, Ayrshire, Southwestern and Midland (together), all have reserves substantially greater than ours, and reserves are extremely difficult to find now that all the major fields are gone. I have kept out of this area since Feb. 10, and if you wish me to back out completely, I will advise these people that we are no longer interested. However, I should like to go back in immediately.

Y. R. Latimer

SL:ph

8

Patented July 27, 1943

KOLBE DEPOSITION  
EXHIBIT 3

2,325,064

## UNITED STATES PATENT OFFICE

ALAN

EXPLOSIVE COMPOSITION

Robert W. Lawrence, Wilmington, Del., assignor  
to Hercules Powder Company, Wilmington,  
Del., a corporation of DelawareNo Drawing. Application June 21, 1940,  
Serial No. 242,742

3 Claims. (Cl. 22-12)

This invention relates to explosive compositions of improved power and safety and more particularly to explosive compositions containing a liquid sensitizing agent which is insensitive to impact, and to explosive compositions which do not contain liquid explosives sensitive to friction.

Explosive compositions which have been used by the prior art have normally been divided into two classes: first, sensitive explosives which contain nitroglycerin or admixtures of nitroglycerin with other alkali esters which are sensitive to impact, and explosive compositions containing no explosive sensitizer which is sensitive to impact. The art has found the use of nitroglycerin explosives extremely useful in blasting operations. However, for a number of operations, it is preferable to use explosives that are relatively insensitive to detonation and are completely or almost completely insensitive to impact and to friction. The insensitive explosives usually contain an explosive salt such as ammonium nitrate in admixture with other salts such as sodium or potassium nitrate and carbonaceous materials such as wood pulp, starch, ivory meal and similar substances together with a sensitizer such as diethyleneglycol dinitrate, or other materials that are insensitive to impact. These types of explosives are used in many operations where it is especially desirable to eliminate the hazards introduced by the use of sensitive explosives.

It is an object of this invention to provide an explosive which is relatively safe to handle. A further object of this invention is to provide an explosive insensitive to impact but which may be detonated with a commercial blasting cap. A further object of this invention is to provide an explosive composition that does not contain a liquid explosive sensitive to impact or friction.

A further object of this invention is to provide an explosive composition that is relatively safe during packing operations and during the handling of bare holes. A further object of this invention is to provide an explosive which is insensitive to impact and which is cap insensitive. Another object of this invention is to provide an explosive composition that contains a liquid nitroperoxide as the sensitizing agent. Other objects will become apparent hereinafter.

In general, the objects of this invention are accomplished by compounding an explosive composition which contains an admixture of oxidizing salts, such as, for example, ammonium, sodium or potassium nitrate, with a reducing or carbonaceous material, such as, for example,

wood flour, ivory meal, hairs or bagasse, coal and the like; and a liquid nitroperoxide, such as, for example, nitroacetone, nitroethane, diethyleneglycol dinitrate or other liquid nitroperoxide which has an oxygen balance and heat of explosion above -1000.

The manufacture of explosives of this invention is carried out in any of the various manners well known in the art and may include, for example, a procedure comprising the following steps: (1) placing the ingredients in a mixer, such as a Tally mixer, on account of an existing salt, such as sodium, potassium or ammonium nitrate, alone or in admixture with one another along with an amount of carbonaceous or reducing material, such as wood flour, hairs, bagasse, etc. The Tally mixer bowl contains the desired amount of a liquid nitroperoxide alone or mixed with other nitroperoxides to obtain a mixture of the desired oxygen balance and sensitivity. The Tally mixer after the ingredients are thoroughly mixed is dumped and the explosive composition packed into normal cartridges that may be manufactured from paper, plastic or metal. The cartridges may be of any convenient diameter, but normally will have a diameter greater than about 1/2 inch as the type explosives of this invention are generally found most useful in quarrying work or in large operations where the large diameter cartridges are desired.

The liquid nitroperoxides in themselves are not explosives; i. e., they will not detonate with a commercial blasting cap. However, balanced explosive compositions containing liquid nitroperoxides produce a quantity of explosive energy approaching that of explosive compositions containing the same percentage of nitroglycerin. The oxygen balance of the nitroperoxide is very low, and, therefore, care in compounding an explosive composition must be exercised so, if the oxygen balance of the final explosive composition is too low, difficulty in effecting detonation is experienced. Thus, for example, nitroethane has an oxygen balance of -50.3%; nitroacetone, an oxygen balance of -56%; diethyleneglycol, an oxygen balance of -50.75%; and diethyleneglycol dinitrate having a smaller proportion of oxygen than nitroethane have even less oxygen balance than they preferably are not to be used alone in explosives, but they may find use in conjunction with the lower nitroperoxides. For example, suitable mixtures may include a mixture containing two parts of nitroacetone and one part of nitrobutyl by weight with an oxygen

balance of -81% or a solution containing equal parts by weight of nitromethane and nitropropane with an oxygen balance of -87%. Therefore, my invention does not contemplate the use of nitroparaffin or mixtures of nitroparaffins having an oxygen balance lower than -100% alone in explosive compositions.

As a specific example of carrying out my invention, I may admix 98 parts by weight of ammonium nitrate with 29 parts by weight of nitromethane and two parts by weight of balsam pulp. The admixture after thorough incorporation is packed into cartridges, and is sensitive to detonation by a No. 8 blasting cap and is found to be a very desirable explosive. Further, the same mixture when tested by the "halved cartridge method of propagation" will cause detonation across a gap as great as 10 inches. It is believed that the nitromethane causes detonation of the composition by interaction with the oxidizing materials, especially the ammonium nitrate. The reaction may be initiated by a blasting cap but not by an impact and thus provides for the production of a very safe but cap sensitive explosive composition. However, this theory is not to be construed as limiting this invention.

A further advantage of the above type explosive over the nitroglycerin containing explosive composition is that nitromethane does not cause the operators to develop headaches when the explosives are handled; and, further, by itself it will not freeze above -15° F. so that when a composition containing nitromethane is used in normal operations, freezing can not occur until this temperature is reached, and often will not occur until a much lower temperature is reached. If freezing of a nitromethane powder occurs, the effect is not as hazardous as the freezing of nitroglycerin powders since the explosive is much less sensitive to thawing operations. Furthermore, the freezing point can readily be lowered by addition of suitable proportions of other liquid nitroparaffins.

In order to point out the invention more specifically, the following examples are given of explosive compositions containing liquid nitroparaffins in varying proportions as the sensitizing ingredients. The compositions of a number of explosives are given in Table 1, and their various properties are listed.

Table 1

Sample	A			
	A	B	C	D
Nitromethane..... per cent.	8.0	10.0	15.0	20.0
Ammonium nitrate.....	92.0	90.0	85.0	80.0
Balsam pulp.....	0	0	5.0	10.0
Wood flour.....	0	0	0	0
Coal.....	0	0	0	0
Sub.	0	0	0	0
Oxygen balance (theoretical)..... per cent.	+4.0	-1.5	-10.5	-15.0
Count, 10" x 6" test.....	120	120	120	110
Detonation rate..... ft./sec.	1,200	1,200	1,200	1,200
Detonation pressure..... lb./sq. in.	2,000	2,000	2,000	2,000
Detonation velocity..... ft./sec.	1,200	1,200	1,200	1,200
Detonation to this bullet.....	(?)	(?)	(?)	(?)

\* Tested on impact machine, 2 lb. falling weight; P-ported shot for direct cracking.

\* Tested by impact of 30-lb. bullet from U. S. Army rifle at 120 ft.

\* When primed with a No. 8 blasting cap.

\* Not tested.

\* Did not shoot.

Other cap sensitive explosive compositions may be prepared in which the nitromethane is replaced by dinitroethane or dinitropropane.

It has been found that other explosive compositions may be prepared, with nitroparaffins, which are not sensitive to detonation by a commercial blasting cap but are sensitive to detonation by a booster charge. Thus, for example, it is possible to produce an explosive composition which furnishes a high amount of power when it detonates, but which is so insensitive that a booster, such as a half stick of 40% dynamite or a charge of dinitroethane or tetryl must be used to prime the composition. In general, this type of insensitive explosive composition is prepared by decreasing the percent of the nitroparaffin present or by using a nitroparaffin having a lower oxygen balance or by combining these two features.

To illustrate the type of explosive compositions which are compounded to be insensitive to detonation by a commercial blasting cap, Table 2 is given wherein the composition and properties of an extra and straight dynamite are listed.

Table 2

Sample	A	
	Per cent	Per cent
Nitroethane.....	10.0	10
Ammonium nitrate.....	75.0	75
Balsam pulp.....	1.0	1.0
Sub.	1.0	1.0
Oxygen balance (theoretical)..... per cent.	-3.0	-3.0
Count, 10" x 6" test.....	120	120
Detonation rate.....	1,200	1,200
Detonation pressure.....	2,000	2,000
Detonation velocity.....	1,200	1,200
Detonation to this bullet.....	1,200	1,200

To illustrate gelatin type dynamites containing nitroparaffin, Table 3 is given wherein the composition and properties of a gelatin explosive are listed.

Table 3

Sample	A	
	Per cent	Per cent
Nitroethane.....	10.0	10
Nitropropane.....	1.0	1.0
Balsam pulp.....	1.0	1.0
Wood flour.....	1.0	1.0
Oxygen balance (theoretical)..... per cent.	-1.5	-1.5
Count, 10" x 6" test.....	120	120
Detonation rate.....	1,200	1,200
Detonation pressure.....	2,000	2,000
Detonation velocity.....	1,200	1,200
Detonation to this bullet.....	1,200	1,200

\* Determined with ballistocardiometer.

It will be understood by those skilled in the art that similar explosive compositions may be prepared by using mixtures of nitromethane with the higher nitroparaffins such as nitropropane and nitrobutane, and that the sensitiveness of such explosive compositions may be controlled by varying the composition of the nitroparaffin mixtures as, for example, by altering the nitromethane and nitroethane content.

It has been found that the explosives containing nitroparaffins such as nitromethane, nitroethane and the like are advantageous because they are highly insensitive to impact and friction and in consequence are especially adapted for packing into metal cans. These nitroparaffin explosive compositions that are cap sensitive may



be manufactured and packed with automatic machinery into a metal can without the danger which this type of operation entails when nitroglycerin containing explosive compositions which are sensitive to impact and friction are manufactured and packed with automatic machinery.

The advantages of the nitroparaffin explosives over the known explosive compositions are insensitivity to impact, lack of causing headaches, and low freezing points, while still being capable of being manufactured to any degree of cap sensitivity.

The explosives of this invention have been found to be highly desirable in all blasting operations when packed in the desired size and type containers. The preferred use, however, is in large operations such as open pit mining and quarry blasting, where the explosive compositions may be used in large diameter cartridges of metal, paper or plastic.

The term "oxygen balance" used in the specification and claims is well known and accepted by the art. The "oxygen balance" of an explosive compound is calculated by determining the total weight of the compound and dividing this weight into the difference between the weight of the oxygen required to completely oxidize the elements of the compound and the weight of the oxygen actually present in the compound.

The "sealed cartridge gap method" is a standard explosive composition test and is described fully in Bulletin 348 issued by the U. S. Bureau of Mines.

It will be understood that the details and examples hereinbefore set forth are illustrative

only, and that the invention as broadly described and claimed is in no way limited thereby.

What I claim and desire to protect by Letters Patent is:

1. An explosive composition comprising an oxygen deficient liquid nitroparaffin containing not more than two nitro groups and having an oxygen balance in excess of about -100% in admixture with an oxidizing salt and a carbonaceous material.

2. An explosive composition comprising an oxygen deficient liquid nitroparaffin containing not more than two nitro groups and having an oxygen balance in excess of about -100% in admixture with ammonium nitrate and a carbonaceous material.

3. An explosive composition comprising nitromethane having an oxygen balance in excess of about -100% in admixture with an oxidizing salt and a carbonaceous material.

4. An explosive composition comprising nitroethane having an oxygen balance in excess of about -100% in admixture with an oxidizing salt and a carbonaceous material.

5. An explosive composition comprising between about 5% and about 45% of nitromethane having an oxygen balance in excess of about -100% in admixture with an inorganic nitrate and a carbonaceous material.

6. An explosive composition comprising between about 15% and about 25% of nitroethane having an oxygen balance in excess of about -100% in admixture with an inorganic nitrate and a carbonaceous material.

ROBERT W. LAWRENCE

## KOLBE DEPOSITION EXHIBIT T

HERCULES POWDER COMPANY  
INCORPORATED

June 27, 1956

The United Electric Coal Companies  
307 North Michigan Avenue  
Chicago 1, Illinois

Attention: Mr. Frank F. Kolbe, President

Gentlemen:

Reference is made to the license agreement of May 1, 1956, entered into by Hercules Powder Company and The United Electric Coal Companies covering Hercules' United States Letters Patent No. 2,325,064 relating to explosive compositions. Among other things, the reference license agreement provides for the payment of royalties at the rate of three-quarters of one cent (\$0.0075) for each pound of explosive composition covered by the claims of the patent. You have requested that Hercules Powder Company waive the royalty payments provided for in the license agreement of May 1, 1956, in consideration of The United Electric Coal Companies making available to Hercules for its use the results of the research and development work conducted by Mr. Frank F. Kolbe with respect to the use of the explosive compositions covered by United States Letters Patent No. 2,325,064.

Hercules Powder Company hereby waives the royalty payment of three-quarters of one cent per pound of explosive composition resulting from the practice of the inventions claimed in United States Letters Patent No. 2,325,064 made and used by you, which would become due under the reference license agreement, so long as Mr. Frank F. Kolbe continues the development and experimental work in the practical application and use of explosive compositions covered by United States Letters Patent No. 2,325,064 at the facilities of The United

Electric Coal Companies, and so long as you make available to Hercules for its unlimited use written reports of such development and experimental work, and so long as you permit authorized representatives of Hercules Powder Company, at Hercules' election, to visit your plants and observe such development and experimental work. You further agree to grant and do hereby grant to Hercules an irrevocable, non-exclusive, royalty-free license, with the right to grant sublicenses without accounting to you, under any invention first conceived or reduced to practice by you in the performance of the development and experimental work contemplated by this agreement, but such license shall be limited to those inventions conceived or reduced to practice while this letter agreement is in effect.

Either party to this letter agreement may terminate the same upon ten (10) days' written notice to the other party. Upon termination of this letter agreement the waiver of royalty payments under the license agreement of May 1, 1956, as herein provided, shall terminate and all royalties provided for in the license agreement shall thereafter accrue and shall be due and payable by United Electric Coal Companies to Hercules Powder Company in accordance with the terms of that agreement.

If the foregoing conditions as to the waiver of royalty payments are acceptable to you, please indicate your acceptance thereof by signing and returning one copy of this letter to us for our files.

Very truly yours,

HERCULES POWDER COMPANY

By /s/ [Illegible]

Assistant General Manager

AGREED TO this 9th day of July, 1956.

THE UNITED ELECTRIC COAL COMPANIES

By /s/ Frank F. Kolbe  
(Title)

## KOLBE DEPOSITION EXHIBIT W-1

February 25, 1958

Mr. Harry La Viers, President  
South-East Coal Company  
Paintsville, Kentucky

Dear Harry:

We have a mining operation in West Kentucky that produces a high grade coal selling on the average for \$6.25. After we get the coal uncovered, it costs us about \$2.50 to transport the coal to the washing plant, wash it, pay royalties, and pay selling and administration expenses.

At our present location, we are running into deeper overburden and therefore have been considering an underground operation.

The coal averages 42 inches and has a good roof and a fair bottom. It is somewhat rolling. The high wall is in good condition.

Do you know of anyone with equipment who would care to come in and mine this coal at a price that would give him and us a profit?

Very sincerely yours,

President

Copy to: Mr. John Morris  
Mr. Robert J. Hepburn

KOLBE DEPOSITION EXHIBIT W-2

SOUTH-EAST COAL COMPANY

Harry LaViers  
President

Paintsville,  
Kentucky

March 6, 1958

Mr. Frank F. Kolbe  
United Electric Coal Company  
307 North Michigan Avenue  
Chicago, Illinois

Dear Frank:

This letter is in reply to yours of February 25th with reference to some possibility of underground mining on your properties in West Kentucky and to tell you that right at the moment I am sorry I can't be helpful.

I hope you are planning on coming to Boca Raton to the next meeting of the Coal Executives so that I can discuss this matter with you personally and see if I can't come up with some suggestion. If you do not attend the Florida meeting, I will be in Chicago before too long, I think, and will drop in and visit with you for a while.

Yours truly,

/s/ Harry  
HARRY LAVIERS

HL:ml

**KOLBE DEPOSITION EXHIBIT W-3**

**SOUTH-EAST COAL COMPANY**

**Harry LaViers**  
**President**

**Paintsville,**  
**Kentucky**

**April 28, 1958**

**Mr. Frank F. Kolbe**  
**United Electric Coal Companies**  
**307 North Michigan Avenue**  
**Chicago, Illinois**

**Dear Frank:**

In response to your inquiry of some time ago, I had hoped that I could recommend a deep mine producer here in Eastern Kentucky to help you with your problem in West Kentucky. The fellow I had in mind has made some other plans, and I am afraid that I do not have a prospect in view whom I could afford to recommend to you.

However, the situation up this way is changing rather rapidly, and if I run across someone I think is desirable, I will advise you.

**Yours truly,**

**/s/ Harry**  
**HARRY LAVIERS**

**HL:ml**



KOLBE DEPOSITION EXHIBIT X

December 3, 1957

Memorandum to: Mr. Robert J. Hepburn

In reply to your memorandum of November 29 regarding deep coal in southern Illinois, I think for the present we can employ our money better other places.

President

KOLBE DEPOSITION EXHIBIT X-1

November 29, 1957

Mr. F. F. Kolbe:

I am attaching copy of a letter from Tom and a map showing the deep coal that was brought to our attention by Bill McCulloch of Roberts & Schaefer.

If I am informed correctly, I would estimate that this No. 6 coal would run around 3% sulphur. However, the ash and Btu should be better than our DuQuoin coal. Of course this does not compare with the 1% ash that Old Ben have under control. It may be that if we would not be interested in deep coal of this type we might be able to offer it to the aluminum company.

I would appreciate your advising me what you think of deep coal of this type.

/s/ R. J. Hepburn  
R. J. HEPBURN

RJH:J  
Attach.

## KOLBE DEPOSITION EXHIBIT X-2

November 25th  
1957

Mr. R. J. Hepburn

Bill McCulloch was in the office this morning discussing the 4 blocks of coal he is trying to dispose of in Franklin County. These consist of the following:

Block #1, 2194.45 acres owned by Franklin County Mining Company in north and east of Benton. This should contain at least 14,000,000 tons of recoverable #6 coal, running from 7' to 8' in thickness at a depth of about 600'. It may be that the fact that some of this is under the City, the reserve will have to be cut considerably. This coal is adjoined on the west by the holdings of Old Ben and on the south by the Freeman Coal Company. The entire eastern boundary adjoins the U. S. Steel Company holdings. While the territory to the West is open, and the holdings could be extended, the majority of the reserve could be mined by Old Ben. Their mine #14 probably is within 2 miles of the western edge. About 2,800,000 tons could be mined from a new opening of the Freeman Coal Company, which is about  $1\frac{3}{4}$  miles from the southern edge. The field is served by the C. & E.I., Mopac and the Eldorado branch of the I. C. At the closest point, Big Muddy River is about 2 miles away.

Block #2 consists of something over 1100 acres or 7,700,000 tons of recoverable #6 coal about 700' deep and lies west of Blocks 3 and 4. This is bound on the north by Freeman, on the west by Peabody's abandoned mine #18, which still has some reserve, and on the south Old Ben's mine #9, whose location is probably between 2 and 3 miles away. The Eldorado branch of the I. C. cuts through this area. It is 7 miles away from the Big Muddy.

Block #3 consists of 660 acres of scattered holdings of the Burr Oak Coal Company, which lies between blocks 2 and 4.

Block #4 consists of 5,025 acres or probably 35,000,000 tons of recoverable #6 coal from 6'10" to 8'7" thick at

a depth of 700', owned by Franklin County Coal Corporation. This is on the Edgewood cutoff of the I. C. and close to the Eldorado branch. It is about 15 miles from the Big Muddy.

I pointed out above that Block #1 could be valuable to Old Ben and Freeman, but Blocks 2, 3 & 4, if filled in by the acquisition of coal owned locally by individuals, would contain approximately 12,620 acres or at least 88,340,000 tons of recoverable #6 coal, as there is approximately 153,000,000 tons in place. In addition, scattered drilling shows the presence of #5 coal 4' to 5' in thickness or approximately 78,600,000 tons in place, of which about 47,000,000 tons should be recoverable.

The coal north in Block #4 is owned by the U. S. Steel Corporation, but the other three sides are open as far as I can tell except for the scattered Burr Oak holdings.

Blocks #1 and #4, as stated above, are owned by the Franklin County Coal Corporation. Ira Westbrook, attorney, is a Trustee and is handling the affairs.

Black Star, which has Block #2, is owned by Roy Carter, who is President of the Company.

Burr Oak is handled by Louis Francour of Francour & Company, investment bankers.

Newton Luarco with the Carter Harrison interests, represents the bond holders of the Franklin County Coal Corporation, and I believe, is Secretary of Burr Oak.

Olin Mathison is a minority stock holder of Burr Oak, that acquired this as a liquidated debt some years ago.

There is some oil production on the Burr Oak and Franklin County properties, but as far as the coal is concerned, the three organizations have agreed to sell as a package. McCulloch has been offered a commission for handling this, but we are at liberty to talk with the principals at any time. Bill has made no concerted effort to sell this, but has discussed it all over the coal field. He has offered it to U. S. Steel and as far as I can tell, his price was \$50.00 per acre. He would not give me a firm price, but insinuated that \$50.00 would take it. He does not know whether or not all cash would be required. This would take \$446,000 at the \$50.00 price. He tells

me that certain operators have scoffed at this figure. Of course, the acreage to be purchased from individuals is not figured in the price of \$446,000.

A map showing the area is attached.

/s/ T. H. L.  
T. H. LATIMER

THL/ah

## KOLBE DEPOSITION EXHIBIT Y

November 7, 1955

Mr. R. J. Hepburn:

I think it best to put down in writing some of our problems in order that we can discuss them intelligently at a later date.

Years ago we had a fairly good Engineering Department. We handled the acquisition of all reserves, the prospect drilling, mapping, building of railroads, bridges, haulage roads, projection of the pits, monthly surveys and reports, planned all drainage work, saw to it that all obstacles to our stripping were removed, kept up not only the topographic but the maps of the various plant areas showing all changes in railroad tracks, pipe lines, power lines, hoppers, etc., analyzed the efficiency of the shovels as well as preparing a shovel report, did the same with the drills, and in general formed a base on which the mines operated. This deteriorated throughout the years from lack of direction and inadequate help.

We now have only two engineers in the field. In Fulton County we have Riley who can be used to good advantage if handled properly. He is capable and willing and I think is learning that the Superintendent is boss. Inman when he arrives will help a great deal. The set-up is not too good regardless of who is there and the engineer continues operating entirely out of the Canton Office.

Cuba is an easy problem in that the present pit will be extended for the life of the mine. We have no new fields to enter as the remaining coal is in a solid block. We will acquire no more property from individuals and once our mapping is completed little engineering work will be required unless major changes are made. It would be wasteful to have an engineer at the mine constantly as long as the mine is under its present set-up.

Buckheart has been in a state of flux ever since it started. It has been a high production mine since 1938. It is a difficult field in that the coal is and has been in many

divided areas. There is much more property to be acquired and the plans for mining in the remaining acreage must be completed and this is a major job. A good engineer really should have his headquarters at the mine and he should be much more than a transitman. He can make himself the most valuable man at the mine next to the Superintendent if he will. There are no facilities for an engineering office there and it should be near the Superintendent. As long as an engineer is in the Canton Office rather than at the mine he will not be used nearly as much as though he was right underfoot.

Mine No. 19 requires little engineering work outside the mine other than transit work and 40 or 50 acres of topography that must be done when our crop line drilling is a little more complete. Donaldson is an engineer himself and does more engineering work than he wants anyone to know about.

Mine No. 25 requires little work at the moment.

At Mine No. 11 we have one man who has some value but is an architect rather than an engineer and as far as I can determine has no particular ambition or desire for responsibility. This is a difficult position to fill and should be held by a man with considerable force. A confident engineer could make himself more valuable here than any mine I know but with our present help we are limited to roughly measuring yardage, shooting in blast holes, making monthly surveys and a few miscellaneous odd constructions jobs and running errands. Holloway is fairly good on structural work and has been a help there.

Our Office Engineer can do beautiful drafting work for reports, etc., but little or no experience in stripping or with any of the problems at the mines, and is not too much inclined to get along well with others. The monthly reports and annual reserve reports are prepared here and there is considerable room for improvement in this line. However, our engineers in the field have been lax in the past in submitting full information with their surveys but I believe this will be corrected.



As to myself, because of lack of help I am neglecting more work than I am doing and have for some time. Traveling alone taken up far too much time. In the past twenty-one months I have driven 77,000 miles at an average of 50 miles per hours. This figures out to 64 days of 24 hours each, or over 10% of the time. This does not include a substantial amount of plane and train travel. This is caused principally by having too many irons in the fire with insufficient help and it means that everything necessary cannot be done. Frankly I would be lost without too much work but the way it is handled at present is not very fair to the Company.

We had until about two years ago a Land Man in Fulton County who kept in touch with everything going on. He was never replaced. I think that Inman can be broken in on this to a considerable extent but, of course, he cannot spend full time at it. We need a local man who either knows or can know everyone and every piece of property in the coal bearing area. Most of our competitors keep someone in each locality where property is to be acquired, either on a salary or a commission basis. On one job in Kentucky Sinclair had such a man for a scout, then when they wanted to acquire the property selected, they brought in 21 oil scouts from Oklahoma and took up the field in two or three days. This was at a time when they had competition in the area.

We have during the years examined something over 200 coal fields. Of those we have taken up, either wholly or partially, only seven. Some of the best were dropped without going into. Some of them taken perhaps not too wisely. The constant search for and investigation of new properties should go on but someone should be broken in to help with this. While there is a report in the files on everything we have ever looked at, it is not necessarily complete as it is not practical to get complete information in a day. It takes someone with the ability to go up with a topographic map, note the outcrops and prepare a rough estimate, as well as dealing with the landowners or promoters. A great deal of the information on topography, coal seams, operations, the various

promoters, prices of land, etc., can hardly be put down on paper. Someone else should be trained to know what he is looking for when he goes into a prospective coal field.

Practically all of our competitors have a far better organization for prospecting than we. Ayrshire, for instance, has at least six drills generally in operation and all under the supervision of a Drilling Superintendent. They also have an engineer following up on the drills at all times so that the surveys of locations, elevations, etc., are always up-to-date. I have seen Sinclair prospect a field with eleven drills while probably that many more were in other fields. While these eleven drills were working the Drilling Superintendent was pushing them and there were several engineering parties in the field. They were able to have their complete estimates in a very short time. Incidentally, this was in a field we turned down for certain reasons but has made a profitable operation for them.

I would like to discuss the entire problem at length with you, either here at the office or some place where we can have plenty of time to go over it thoroughly as I am afraid we are not building up properly the basis on which our future lies.

T. H. LATIMER

THL:ga

1650

KURTZ DEPOSITION  
EXHIBIT 8

# STEAM-ELECTRIC PLANT FACTORS

(Fuel Consumption and Costs, Plant Capacity, Net  
Generation, 1967, and Planned Capacity, 1968-1974.)

# 1968

EDITION

AN ANNUAL STUDY BY THE  
DIVISION OF ECONOMICS  
AND STATISTICS

Eighteenth Edition, October 1968  
Copyright, National Coal Association, 1968

★ ★ ★

NATIONAL COAL ASSOCIATION  
1130 Seventeenth St., N.W.  
Washington, D. C. 20036

Price \$5.00  
Foreign Mailings \$8.00





Table 1. Steam-Electric Plant Capacity, Net Generation, Fuel Consumption, and Unit Costs, 1967

CITY	COMPANY	PLANT	INSTALLED GENERATING CAPACITY (Thous. Kw)	NET GENERATION (Million Kw-hr)	FUEL DESIGNED FOR: C-COAL S-STOKER P-PULV. O-OIL G-GAS	COAL		OIL		GAS		COST PER MILLION BTU (CENTS)				PERCENT OF CONSUMPTION IN B.T.U.				
						TONS (Thous.)	CU YD PLANT	BARRELS (Thous.)	COST PER BARREL F.O.B. PLANT	AS BURNED	BTU PER GALLON	MILLION CUBIC FEET	COST AS BURNED (¢/MCF)	BTU PER CUBIC FOOT	F.O.B. PLANT*			AS BURNED		
															COAL	COAL	OIL	GAS	COAL	OIL
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
ILLINOIS - Cont'd																				
ILLINOIS - Cont'd																				
Savanna	Interstate Power Company	Savanna 2	10.5	3.5	C(S)OC	3	na	na	10,697 4	-	na	na	na	1,050 4	na	na	na	na	66	34
Moline	Iowa-Illinois Gas & Electric Co.	Moline	99.1	339.5	C(S)OC	23	5.55	6.46	10,651	2	4.53	4.53	137,255	3,817	29.2	1,055	26.1	30.4	78.5	21.5
Monmouth	Union Electric Company	Cahokia	300.0	357.4	C(P)O	233	4.76	5.21	11,828	136	2.81	2.82	151,958	-	-	20.1	22.0	44.2	86	14
Venice	"	Venice No. 1	55.0	4.6	OC	-	-	-	-	2	4.10	3.93	152,000	83	23.6	1,043	-	-	61.5	38.5
Venice	"	Venice No. 2	500.0	2,102.8	C(P)G	1,028	4.65	4.92	11,358	-	-	-	-	3,135 23	23.8	1,044	20.5	21.7	22.8	77.2
Fairfield	Fairfield Mun. Light & Power Plant	Fairfield 2	12.5	30.8	C	33	na	na	10,697 4	-	-	-	-	-	-	na	na	-	100	-
Highland	Highland Electric Light Plant	Highland 2 6	14.6	27.1	C(S)	25	na	na	10,350 7	-	-	-	-	-	-	na	21.4	-	100	-
Mount Carmel	Mount Carmel Public Utility	Mount Carmel	20.5	76.9	C(S)	32	3.32	5.53	11,728	-	-	-	-	-	-	22.7	23.6	-	100	-
Peru	Peru, City of	Peru 6 7	15.3	32.7	C(S)	25	na	na	12,730 7	-	-	-	-	-	-	na	na	-	100	-
Princeton	Princeton Municipal Utilities	Princeton 2 6	2.8	8.0	C(S)G	-	-	-	-	-	-	-	150 8	na	1,030 7	-	-	na	-	100
Rockville	Rockville Municipal Utilities	Rockville 2 6	12.7	36.8	OC	22	na	na	10,697 4	-	-	-	690	na	1,050 4	na	na	-	na	39
Springfield	Springfield Water, Lt. & Pwr. Dept.	Lakeside 6 6	146.0	541.1	C(P) 2	343	5.33	5.33	10,663	-	-	-	-	-	-	25.0	25.0	-	100	-
Winnetka	Winnetka, Village of	Winnetka 5 7	25.5	55.5	C(S)	24	na	na	12,000 7	-	-	-	350	na	1,058 7	na	na	-	na	61
Marion	Southern Illinois Power Corp.	Marion	99.0	280.8	C 2	155	4.01	4.01	11,574	0.3	4.33	4.33	137,243	-	-	17.3	17.3	75.1	100	-
TOTAL ILLINOIS			13,250.8	62,211.9	-	28,245	4.92	5.07	10,697	192	3.21	3.23	148,089	44,309	26.9	1,047	23.0	23.7	51.9	25.7
INDIANA																				
Ind.-Ill. Lines	Commonwealth Edison Co. of Ind., Inc.	State Line	972.0	5,356.1	C(P)G 2	1,977 8	4.92 8	5.26 8	11,227	-	-	-	8,637	24.7	1,047	22.2 8	23.4 8	-	23.6	83
Madison	Indiana-Kentucky Electric Corp.	Clifty Creek	1,303.6	8,865.2	C(P)	3,753	4.19	4.19	10,964	4	na	na	150,000 4	-	-	19.1	19.1	na	100	-
Sullivan	Indiana & Michigan Electric Co.	Breed	450.0	2,726.6	C(P) 3	1,079	4.42	4.43	11,254	2	4.18	4.25	137,146	-	-	19.6	19.7	73.9	100	-
Lavencsburg	"	Tanners Creek	1,098.0	5,747.5	C(P) 3	2,280	4.58	4.61	11,392	30	4.18	4.15	135,300	-	-	20.1	20.2	73.0	100	-
Mishawaka	"	Twin Branch	394.0	1,239.5	C(S)P	649	6.68	6.65	10,903	10	3.97	3.91	137,457	-	-	30.6	30.5	67.7	100	-
Indianapolis	Indianapolis Power & Light Co.	E. W. Stout	383.8	1,761.8	C(S)P O	821	5.54	5.64	11,562	-	-	-	-	-	-	24.0	24.4	-	100	-
Indianapolis	"	Perry K & W	59.1	74.8	C(S)P O	51	na	na	11,133	-	-	-	-	-	-	24.0	26.0	-	100	-
Canterton	"	H. T. Prichard	396.4	1,745.1	C(P) O	869	na	3.74	10,984	-	-	-	-	-	-	22.9	23.3	-	100	-
Petersburg	"	Petersburg 10	261.7	983.4	C(P) O	418	3.72	5.83	11,245	-	-	-	-	-	-	16.9	17.0	-	100	-
Dune Acres	Northern Indiana Pub. Service Co.	Bailey	194.0	1,268.9	OC 2	446	5.56	6.55	10,753	-	-	-	2,412	25.9	1,000	24.7	25.9	-	25.9	81
Michigan City	"	Michigan City	215.0	623.5	C(P) 2	289	6.08	5.82	10,753	-	-	-	1,450	30.2	1,000	28.3	30.5	-	30.2	81
Gary	"	D. H. Mitchell	414.3	2,976.7	C(P)	1,213	5.59	5.82	11,128	-	-	-	2,011	25.5	1,000	25.1	26.2	-	25.5	93
Neppanee	"	Neppanee 2	12.3	23.6	C(S)	21	na	na	11,134 4	-	-	-	-	-	-	na	39.5	-	100	-
Terre Haute	Public Service Co. of Ind., Inc.	Dresser	221.0	371.8	C(S)P	240	4.59	4.79	10,885	24	na	3.98	140,000	-	-	21.1	22.0	67.7	97	
Edwardsport	"	Edwardsport	133.0	561.6	C(P)	341	4.39	4.52	10,947	13	na	4.06	140,000	-	-	20.1	20.7	69.0	99	
New Albany	"	Gallagher	600.0	3,794.9	C(P)	1,748	4.36	4.49	11,103	10	na	4.06	140,000	-	-	19.6	20.2	68.7	100	-
Noblesville	"	Noblesville	100.0	112.1	C(P)	65	6.49	6.65	11,690	3	na	4.12	140,000	-	-	27.8	28.5	70.0	99	
Terre Haute	"	Wabash River	521.0	3,247.0	C(P)	1,498	4.36	4.43	10,983	10	na	4.06	140,000	-	-	19.8	20.2	69.1	100	-
Hamberg	Southern Indiana Gas & Elec. Co.	Culley	135.7	823.8	C(P)	425	3.90	3.90	10,697	-	-	-	-	-	-	18.2	18.3	-	100	-
Danversville	"	Ohio River	112.5	419.8	C(S)P	282	3.64	3.64	10,762	-	-	-	-	-	-	16.9	16.5 5	-	100	-
Anderson	Anderson Municipal Light & Power	Anderson	19.0	-	C(S)	-	-	5.99	11,725	-	-	-	-	-	-	-	-	-	-	21
Crawfordsville	Crawfordsville Elec. Lt. & Power Co.	Crawfordsville	40.2	113.8	C(S)	78	5.99	8.38	12,060	-	-	-	-	-	-	25.5	25.5	-	100	-
Fort Wayne	Fort Wayne Light & Power Works	Lawton Park	47.5	153.9	C(S)	98	8.38	6.75	11,000	-	-	-	-	-	-	34.7	34.7	-	100	-
Frankfort	Frankfort Light & Power Plant	Frankfort	36.0	96.0	C(S)	67	6.75	na	11,700 7	-	-	-	-	-	-	30.7	30.7	-	100	-
Huntingburg	Huntingburg Mun. Lt. & Water Plt.	Huntingburg 7	6.8	13.6	C(S)	18	na	na	-	-	-	-	-	-	-	na	na	-	100	-
Jasper	Jasper Municipal Electric Utility	Jasper	9.5	39.9	C(S)	41	4.72	4.72	12,000	-	-	-	-	-	-	19.7	19.7	-	100	-
Logansport	Logansport Municipal Utilities	Logansport	57.3	111.0	C(S)	59	7.82	8.02	12,500	-	-	-	-	-	-	31.3	30.4 5	-	100	-
Peru	Peru Electric Light & Power Dept.	Peru	40.0	88.9	C(P)	51	na	7.34	11,600	-	-	-	-	-	-	na	31.9	-	100	-
Richmond	Richmond Mun. Power & Light Dept.	Johnson Street	30.0	71.1	C(S)	52	6.58	6.56	11,598	-	-	-	-	-	-	28.4	28.3	-	100	-
Richmond	"	Whiteswater Valley	30.0	220.8	C(S)	118	6.40	6.38	11,255	-	-	-	-	-	-	28.4	28.4	-	100	-
Rushville	Rushville City Utilities	Rushville 7	8.3	19.5	C(S)	19	na	na	11,134 4	-	-	-	-	-	-	na	na	-	100	-
Washington	Washington Light & Power	Washington 7	18.0	58.2	C	54	na	na	12,000 7	-	-	-	-	-	-	na	na	-	100	-
TOTAL INDIANA			8,320.0	43,710.4	-	19,120	4.76	4.86	11,134	106	4.13	4.06	138,769	14,510	25.6	1,028	21.4	21.8	69.8	24.9

Plant	Type of Reactor	Installed Capacity (thous. kw)	Net Generation (million kw-hr)	Kind of Fuel Used
<u>12</u> Haddam #1	Pressurized water	600.0	324.1 <sup>a</sup>	Enriched uranium
	<sup>a</sup> Consists mainly of test generation during late 1967. Plant was placed in commercial operation in December, 1969.			
<u>12a</u> Rowe	Pressurized water	185.0	1,272.8	Enriched uranium
<u>12b</u> Indian Point	Pressurized water	275.0	1,622.0 <sup>a</sup>	Enriched uranium
	<sup>a</sup> Includes kWh generated by oil. (Plant is designed for production of electric energy by both nuclear and conventional fuels.) Used 228,307.66 grams of uranium at 27.76¢ per million Btu and 863,788 bbl of oil at 149.112 Btu per gal., \$2.04 per bbl and 31.7¢ per million Btu "as burned."			
<u>12c</u> Shippingport	Pressurized water	100.0	455.6	Natural and enriched uranium
<u>12d</u> Saxton Nuclear	na	10.0	6.9 <sup>a</sup>	na
	<sup>a</sup> Generation by Saxton (non-nuclear) plant from steam supplied from small nuclear reactor adjacent to plant and owned by Saxton Nuclear Experimental Corp.			
<u>12e</u> Peach Bottom #1	High temp., helium cooled, graphite mod.	46.0	144.2	Uranium
	Plant used 12,394 grams of uranium at 29.7 cents per million Btu.			
<u>12f</u> Dresden	Boiling water	208.7	807.0	Enriched uranium
<u>12g</u> Big Rock	Boiling water, high power density	75.0	502.0	Uranium dioxide
	Plant used 67,157 grams of U235.			

(Footnotes continued on next page)



Table 4. Capacity of New Conventional Steam-Electric

Generating Plants or Units Planned or Under Construction, 1968-74

CITY	COMPANY	PLANT	N - NEW E - EXISTING PLANT	1968		SCHEDULED YEAR OF COMPLETION AND KILOWATT CAPACITY OF NEW UNITS									
				NAMEPLATE 1/	DEFERRABLE 2/	1969	1970	1971	1972	1973	1974	1969	1970	1971	1972
						NAMEPLATE 1/ DEFERRABLE 2/	NAMEPLATE 1/ DEFERRABLE 2/	NAMEPLATE 1/ DEFERRABLE 2/	CAPACITY 3/	CAPACITY 3/	CAPACITY 3/	NAMEPLATE 1/ DEFERRABLE 2/	NAMEPLATE 1/ DEFERRABLE 2/	NAMEPLATE 1/ DEFERRABLE 2/	CAPACITY 3/
<b>NEW ENGLAND</b>															
<b>CONNECTICUT</b>															
1. Montville	Connecticut Light & Power Company	Montville No. 6	E	-	-	-	-	-	-	-	-	-	-	400,000	400,000
2. Bridgeport	United Illuminating Company	Bridgeport Harbor No. 3	E	374,340	388,153	-	-	-	-	-	-	-	-	-	-
<b>TOTAL CONNECTICUT</b>				<b>374,340</b>	<b>388,153</b>	-	-	-	-	-	-	-	-	<b>400,000</b>	<b>400,000</b>
<b>MAINE</b>															
1. Caribou	Maine Public Service Company	Caribou No. 3	E	-	-	-	-	-	33,000 2/	33,000 2/	-	-	-	-	-
<b>TOTAL MAINE</b>				-	-	-	-	-	<b>33,000</b>	<b>33,000</b>	-	-	-	-	-
<b>MASSACHUSETTS</b>															
1. Sandwich	New England Gas & Electric Assn.	Canal No. 1	N	515,000	560,000	-	-	-	-	-	-	-	-	-	-
2. Salem	New England Power Co.	Salem Harbor No. 4	E	-	-	595,000	630,000	-	-	-	450,000	-	-	-	-
3. Somerset	"	Brayton Point No. 3	E	-	-	595,000	630,000	-	-	-	450,000	-	-	-	-
<b>TOTAL MASSACHUSETTS</b>				<b>515,000</b>	<b>560,000</b>	-	-	-	-	-	-	-	-	-	-
<b>NEW HAMPSHIRE</b>															
1. Bow	Public Service Company of N.H.	Merrimack No. 2	E	345,600	331,000	-	-	-	-	-	-	-	-	-	-
<b>TOTAL NEW HAMPSHIRE</b>				<b>345,600</b>	<b>331,000</b>	-	-	-	-	-	-	-	-	-	-
<b>MIDDLE ATLANTIC</b>															
<b>NEW JERSEY</b>															
1. Jersey City	Public Service Elec. & Gas Company	Hudson No. 2	E	620,000	620,000	25,000	25,000	-	-	-	-	-	-	-	-
2. Vineland	Vineland, City of	Municipal No. 10	E	-	-	25,000	25,000	-	-	-	-	-	-	-	-
<b>TOTAL NEW JERSEY</b>				<b>620,000</b>	<b>620,000</b>	<b>25,000</b>	<b>25,000</b>	-	-	-	-	-	-	-	-
<b>NEW YORK</b>															
1. New York	Consolidated Edison Co. of New York	Arthur Kill No. 3	E	535,500	515,000	-	-	-	-	-	-	-	-	-	-
2. New York	"	59th Street	E	35,000	35,000	-	-	-	-	-	-	-	-	-	-
3. Jamestown	Jamestown, City of	S. A. Carlson No. 6	E	25,000	25,000	-	-	-	-	-	-	-	-	-	-
4. Northport	Long Island Lighting Company	Northport No. 2	N	387,090	380,000	195,000	195,500	-	-	-	-	-	-	-	-
5. Tunkias Cove	Orange & Rockland Utilities, Inc.	Lovett No. 5	E	-	-	195,000	195,500	-	-	-	-	-	-	-	-
<b>TOTAL NEW YORK</b>				<b>982,590</b>	<b>935,000</b>	<b>195,000</b>	<b>195,500</b>	-	-	-	-	-	-	-	-
<b>PENNSYLVANIA</b>															
1. Springdale	Duquesne Light Company	Cheswick No. 1	N	-	-	609,000	640,000	565,250	570,000	-	-	-	-	-	-
2. Homer City	Pennsylvania Electric Co.	Homer City No. 1 & 2	N	-	-	-	-	609,000	640,000	-	-	-	-	-	-
3. York Haven	Pennsylvania Power & Light Co.	Brunner Island No. 3	E	790,000	765,000	-	-	-	-	-	-	-	-	-	-
4. Indiana County	"	Conemaugh No. 1 & 2 4/	N	-	-	-	-	841,200	900,000	841,200	900,000	-	-	-	-
5. Armstrong County	"	Keystone No. 1 & 2	E	865,000	900,000	-	-	-	-	-	-	-	-	-	-
6. Montour County	"	Strawberry Ridge	N	-	-	500,000	540,000	500,000	540,000	-	-	765,000	-	-	-
7. Near Muncaster	West Penn Power Company	Hatz'ids Ferry No. 1, 2&3	N	-	-	-	-	-	-	-	-	540,000	-	-	-
<b>TOTAL PENNSYLVANIA</b>				<b>1,655,000</b>	<b>1,665,000</b>	<b>1,109,000</b>	<b>1,180,000</b>	<b>2,515,450</b>	<b>2,650,000</b>	<b>841,200</b>	<b>900,000</b>	<b>1,305,000</b>	-	-	-
<b>EAST NORTH CENTRAL</b>															
<b>ILLINOIS</b>															
1. Bartonville	Central Illinois Light Co.	E. D. Edwards No. 2 & 3	E	281,000	281,000	-	-	-	-	-	-	300,000	-	-	-
2. Coffeen	Central Illinois Public Service Co.	Coffeen No. 2	E	-	-	-	-	-	-	-	-	400,000	-	-	-
3. Kincaid	Commonwealth Edison Co.	Kincaid No. 2	N	560,000	600,000	-	-	-	-	-	-	-	-	-	-
4. Baldwin	Illinois Power Co.	Baldwin No. 1 & 2	N	-	-	-	-	623,050	600,000	-	-	-	600,000	-	-
5. Springfield	Springfield Water, Lt. & Power Dept.	Lakeside No. 8	E	80,000	80,000	-	-	-	-	-	-	-	-	-	-
6. Venice	Union Electric Co.	Venice No. 1	E	-	-	-	-	-	-	-	-	600,000	-	-	-
7. Venice	"	Venice No. 2	E	-	-	-	-	-	-	-	-	-	600,000	-	-
<b>TOTAL ILLINOIS</b>				<b>921,000</b>	<b>961,000</b>	-	-	<b>623,050</b>	<b>600,000</b>	-	-	<b>1,300,000</b>	<b>1,200,000</b>	-	-

Table 4. Capacity of New Conventional Steam-Electric Generating Plants or Units Planned or Under Construction, 1968-74

SCHEDULED YEAR OF COMPLETION AND KILOWATT CAPACITY OF NEW UNITS														
CITY	COMPANY	PLANT	N - NEW E - EXISTING PLANT	1968		1969		1970		1971		1972	1973	1974
				NAMEPLATE 1/	DEPENDABLE 2/	NAMEPLATE 1/	DEPENDABLE 2/	NAMEPLATE 1/	DEPENDABLE 2/	NAMEPLATE 1/	DEPENDABLE 2/	CAPACITY 3/	CAPACITY 3/	CAPACITY 3/
EAST NORTH CENTRAL - Cont'd														
INDIANA														
1. Petersburg	Indiana Statewide Rural Elec. Coop.	Petersburg No. 1 & 2	N	233,000	233,000	-	-	116,000	116,000	-	-	-	-	-
2. Indianapolis	Indianapolis Power & Light Co.	"	N	-	-	-	-	-	-	-	-	-	430,000	-
3. Petersburg	"	Petersburg No. 2	N	-	-	420,000	450,000	-	-	-	-	-	450,000	-
4. Jasper	Jasper Municipal Electric Utility	Jasper	E	13,200	13,200	-	-	-	-	-	-	-	-	-
5. Dune Acres	Northern Indiana Public Serv. Co.	Bailey No. 8	E	413,500	350,000	-	-	-	-	-	-	-	-	-
6. Hammond	"	Mitchell No. 11	E	-	-	-	-	115,100	115,200	-	-	-	-	-
7. Vermillion County	Public Service Co. of Indiana	Cayuga No. 1	N	-	-	-	-	500,000	500,000	-	-	-	-	-
8. Terre Haute	"	Wabash River No. 6	E	318,000	356,000	-	-	-	-	-	-	-	-	-
9. Lafayette	Purdue University	Lafayette	N	7,500 2/	7,500	-	-	-	-	-	-	-	-	-
10. Yankee Town	Southern Indiana Gas & Electric Co.	Warrick No. 4 5/	E	-	-	5,000 2/	5,000	300,000	150,000	-	-	-	-	-
11. South Bend	University of Notre Dame	South Bend	N	-	-	-	-	-	-	-	-	-	-	-
TOTAL INDIANA				985,200	959,700	425,000	455,000	1,031,100	881,200	-	-	-	900,000	-
MICHIGAN														
1. Harbor Beach	Detroit Edison Co.	Harbor Beach No. 1	N	100,000	100,000	-	-	-	-	-	-	-	-	-
2. Monroe	"	Monroe No. 1 & 2	N	-	-	-	-	750,000	790,000	750,000	790,000	-	-	-
3. Port Huron	"	Port Huron	N	3,750	2,000	-	-	-	-	-	-	-	-	-
4. East China Twp.	"	St. Clair No. 7	E	500,000	500,000	-	-	-	-	-	-	-	-	-
5. Trenton	"	Trenton Channel No. 9	E	500,000	519,000 5/	-	-	-	-	-	-	-	-	-
6. Wyandotte	"	Wyandotte-North 9	E	12,500	12,000 5/	-	-	-	-	-	-	-	-	-
7. Holland	Holland Board of Public Works	J. de Young No. 5	E	30,000	30,000	-	-	-	-	-	-	-	-	-
8. Lansing	Lansing Board of Water & Light	D. C. Eckart No. 5 & 6	E	-	-	-	-	80,000	74,000	-	-	-	-	-
9. Boyne City	Northern Michigan Electric Coop., Inc.	Advance No. 3	E	22,000	22,000	-	-	-	-	-	-	-	-	-
10. Traverse City	Traverse City Light & Power Dept.	Traverse City	E	16,500	16,500	-	-	-	-	-	-	-	-	-
TOTAL MICHIGAN				1,184,750	1,201,500	-	-	830,000	864,000	750,000	790,000	-	-	-
OHIO														
1. Aberdeen	Cincinnati Gas & Electric Co.	J. M. Stuart No. 1, 2 & 3	N	-	-	11,000	11,000	610,000	580,000	610,000	580,000	580,000	-	-
2. New Richmond	"	W. C. Beckjord No. 6	E	434,000	440,000	-	-	-	-	-	-	-	-	-
3. Cleveland	Cleveland Dept. of Public Utilities	Lake Road No. 11	E	75,000	75,000 5/	-	-	-	-	-	-	-	-	-
4. Avon Lake	Cleveland Electric Illuminating Co.	Avon Lake No. 9	E	-	-	-	-	625,000	625,000	-	-	-	-	-
5. Cleveland	"	Eastlake	E	-	-	-	-	-	-	-	-	625,000	-	-
6. Dover	Dover Electric Light & Power	Dover	E	22,000 2/	22,000	-	-	-	-	-	-	-	-	-
7. Napoleon	Napoleon Municipal Utilities	Napoleon	E	12,500	12,500	-	-	-	-	-	-	-	-	-
8. Norwalk	Norwalk Municipal Light Plant	Norwalk	E	18,328 2/	18,328	-	-	-	-	-	-	-	-	-
9. Stratton	Ohio Edison Company	W.H. Sammis No. 5, 6 & 7	E	940,500	925,000	-	-	-	-	623,000	600,000	-	-	-
10. Beverly	Ohio Power Company	Muskingum River No. 5	E	590,000	615,000	-	-	-	-	-	-	-	-	-
11. Oregon	Toledo Edison Company	Bay Shore No. 4	E	217,600	213,000	-	-	-	-	-	-	-	-	-
TOTAL OHIO				2,309,928	2,320,828	11,000	11,000	1,235,000	1,205,000	1,233,000	1,180,000	1,205,000	-	-
WISCONSIN														
1. Genoa	Dairyland Power Cooperative	Genoa	E	-	-	325,000	325,000	-	-	-	-	-	-	-
2. Marshfield	Marshfield Electric & Water Dept.	Wildwood No. 5	E	20,000	20,000	-	-	-	-	-	-	-	-	-
3. Oak Creek	Wisconsin Electric Power Company	South Oak Creek No. 8	E	41,000	41,000	140,000	140,000 8/	-	-	-	-	-	-	-
4. Milwaukee	"	Valley No. 1 & 2	N	140,000	140,000	330,000	330,000	-	-	-	-	-	-	-
5. Sheboygan	Wisconsin Power & Light Co.	Edgewater No. 4	E	-	-	795,000	795,000	-	-	-	-	-	-	-
TOTAL WISCONSIN				201,000	201,000	795,000	795,000	-	-	-	-	-	-	-
WEST NORTH CENTRAL														
IOWA														
1. Ames	Ames, City of	Ames No. 7	E	35,000	35,000	-	-	-	-	-	-	-	-	-
2. Clinton	Interstate Power Company	M. L. Kapp No. 2	E	-	-	-	-	-	-	-	-	216,000	-	-
3. Cedar Rapids	Iowa Electric Light & Power Co.	Prairie Creek No. 4	E	130,000	140,000	-	-	-	-	-	-	-	-	-
4. Sioux City	Iowa Public Service Co.	Neal No. 2	E	-	-	-	-	-	-	-	-	325,000	-	-
5. Burlington	Iowa Southern Utilities Co.	Burlington No. 1	N	211,950	200,000	12,000 2/	12,000	-	-	-	-	-	-	-
6. Ames	Iowa State University	Ames, Iowa	N	-	-	81,000 3/	81,000	-	-	-	-	-	-	-
7. Muscatine	Muscatine Municipal Elec. Plant	Muscatine No. 8	E	-	-	93,000	93,000	-	-	-	-	-	-	-
TOTAL IOWA				376,950	375,000	-	-	-	-	-	-	541,000	-	-

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## KURTZ DEPOSITION EXHIBIT 9

## BITUMINOUS COAL FACTS 1966

. . . .

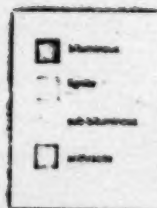
The transportation revolution is not limited to the carriers of bulk coal. Another comparatively new development is the mine-mouth generating station that uses a coal-by-wire technique. A single huge generating station, built almost atop a coal mine, can serve several utility systems through extra-high-voltage transmission line interconnections.

Mine-mouth generating stations are becoming more numerous in such states as Pennsylvania, West Virginia and Illinois where the reserves of coal are available and consumer demands are rapidly increasing. . . .

Kurtz Deposition Exhibit 10

Bituminous Coal Facts 1968

new producing areas  
in the  
United States



...

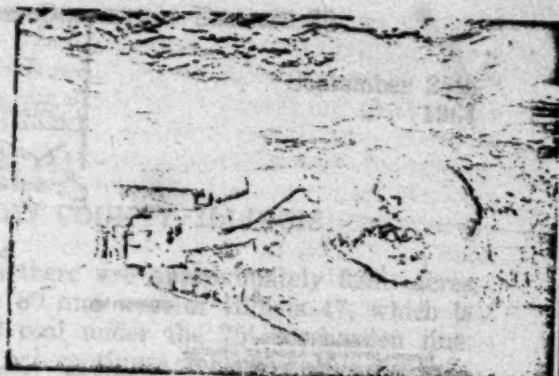
# Steam-Electric Plant Capacity, Net Generation, Fuel Consumption and Unit Costs by Regions and States, 1954

REGION AND STATE	NUMBER OF COMPANIES 1/	NUMBER OF PLANTS	INSTALLED CAPACITY (Thous. kw.) 2/	NET GENERATION (Mwh.) 3/	FUEL MIXTURE (PERCENTAGE)			FUEL COST PER UNIT 4/			
					STEAM (Thous.)	COAL (Percent)	GAS (Percent)	STEAM (Cents)	COAL (Cents)	GAS (Cents)	UNIT (Cents)
NEW ENGLAND											
1 ... Connecticut	5	12	2,325.3	12,363.1	4,429	3,077	261	4.49	9.96	2.11	34.4
2 ... Maine	3	4	436.6	2,400.8	-	4,366	-	-	-	2.13	-
3 ... Massachusetts	13	39	5,793.1	19,717.3	3,725	10,890	9,164	4.70	8.96	2.94	32.7
4 ... New Hampshire	2	3	367.2	1,736.3	361	1,416	-	9.40	9.59	2.82	47.7
5 ... Rhode Island	3	4	365.1	1,366.0	373	800	128	9.90	9.27	2.16	35.9
6 ... Vermont	1	1	30.4	12.8	30	82	-	9.15	2.82	-	10.1
7 ... TOTAL	33	93	7,359.7	37,345.3	8,877	37,391	9,363	5.14	9.17	2.76	33.1
MIDDLE ATLANTIC											
8 ... New Jersey	5	10	5,961.4	26,760.9	6,826	14,918	21,187	7.20	7.97	1.96	39.5
9 ... New York State	8	23	12,971.3	56,956.9	13,079	39,450	79,877	7.87	7.87	2.60	37.9
10 ... New York City	2	17	6,899.3	33,776.1	3,967	28,383	64,187	8.43	8.84	1.60	32.7
11 ... New York State (Excl. N.Y.C.)	6	16	6,082.1	27,177.9	7,994	43	1,779	7.20	7.34	2.47	33.1
12 ... Pennsylvania	13	43	16,000.2	77,450.7	26,426	6,457	325	3.37	3.74	2.67	35.1
13 ... Philadelphia	1	8	3,365.2	16,000.3	4,739	6,331	-	3.37	3.89	2.61	36.1
14 ... Pennsylvania (Excl. Phila.)	1	2	2,635.0	11,451.4	1,235	320	-	3.37	3.74	2.66	36.1
15 ... TOTAL	41	122	55,901.2	251,113.1	52,359	52,391	97,361	6.37	6.91	2.50	36.1
EAST NORTH CENTRAL											
16 ... Illinois	18	30	11,369.3	59,970.1	27,333	14,581	41,981	4.49	5.00	3.31	33.9
17 ... Indiana	10	32	6,182.2	40,364.9	13,108	36,132	62	5.15	5.15	3.02	36.6
18 ... Michigan	16	33	17,761.3	62,551.2	17,333	13	62	7.20	7.20	2.39	37.7
19 ... Ohio	23	48	11,029.7	60,020.6	26,645	89	2,772	5.30	5.33	3.96	47.7
20 ... Wisconsin	17	33	4,686.2	24,413.7	10,413	31	1,011	4.21	4.21	2.12	36.1
21 ... TOTAL	82	176	41,038.7	212,313.7	87,831	101,302	17,366	5.30	5.33	3.13	36.1
WEST NORTH CENTRAL											
22 ... Iowa	10	26	2,102.8	9,443.3	2,863	33	37,360	5.10	5.76	5.64	33.5
23 ... Kansas	10	33	2,433.3	11,716.8	1,104	72	117,333	6.30	6.31	3.76	37.9
24 ... Minnesota	23	36	2,671.6	12,916.7	6,138	122	48,213	6.70	6.90	3.11	33.5
25 ... Missouri	10	26	3,261.7	14,900.2	3,907	36	43,263	6.40	6.71	3.00	33.0
26 ... Nebraska	12	11	1,799.7	8,147.1	1,418	36	26,448	7.17	7.39	3.19	36.1
27 ... North Dakota	4	14	286.0	1,401.2	788	4	2,361	5.90	5.90	-	36.1
28 ... South Dakota	4	14	286.0	1,401.2	788	4	2,361	5.90	5.90	-	36.1
29 ... TOTAL	78	153	17,746.1	75,448.3	24,773	307	304,366	6.30	6.31	3.13	36.1
SOUTH ATLANTIC											
30 ... Delaware	2	3	725.3	3,362.6	1,126	32	3,342	7.30	7.40	3.66	36.9
31 ... District of Columbia	1	27	331.0	1,126	32	-	-	9.30	9.30	-	36.9
32 ... Florida	13	37	9,746.3	33,631.8	3,913	30	93,939	6.15	6.15	3.09	33.0
33 ... Georgia	5	11	3,097.4	14,799.1	6,096	30	309	7.00	7.00	3.09	33.0
34 ... Maryland	7	17	5,391.0	17,321.3	6,438	177	71	7.18	7.27	2.82	41.1
35 ... North Carolina	3	13	1,799.7	8,147.1	1,418	36	26,448	7.17	7.39	3.19	36.1
36 ... South Carolina	4	14	286.0	1,401.2	788	3	2,361	7.00	7.00	4.41	39.5
37 ... Virginia	6	11	1,645.3	9,845.3	2,660	121	18,000	7.30	7.40	3.13	36.1
38 ... West Virginia	5	12	4,441.3	23,563.3	3,321	70	1,360	6.36	6.63	3.30	36.1
39 ... TOTAL	63	153	31,344.7	128,373.7	40,313	537	171,361	6.30	6.31	3.13	36.1
EAST SOUTH CENTRAL											
40 ... Alabama	4	11	6,631.9	34,930.7	13,955	36	7,000	3.19	3.23	3.99	37.4
41 ... Kentucky	7	13	3,735.0	29,818.7	11,317	2	747	3.43	3.72	3.99	37.4
42 ... Mississippi	3	11	1,119.8	5,281.9	2	3	57,676	no	no	3.30	37.4
43 ... Tennessee	4	17	6,232.7	31,151.1	11,128	34	13,394	6.43	6.43	3.76	36.2
44 ... TOTAL	18	42	17,660.3	101,202.3	36,353	75	81,817	4.21	4.21	3.76	36.2
WEST SOUTH CENTRAL											
45 ... Louisiana	2	6	1,897.7	6,793.4	-	36	30,891	-	-	2.41	33.4
46 ... New Mexico	7	26	4,481.3	17,721.9	-	1	196,434	-	-	2.96	21.6
47 ... Oklahoma	7	39	3,373.3	13,097.5	-	3	162,861	-	-	1.68	18.6
48 ... Texas	8	37	24,413.7	101,155.8	-	3	1,000,100	-	-	1.68	18.6
49 ... TOTAL	25	110	34,165.7	135,769.6	-	43	1,200,386	-	-	1.68	18.6
MOUNTAIN											
50 ... Arizona	4	11	1,830.8	6,871.9	843	6	60,849	6.90	3.97	4.99	39.3
51 ... Colorado	9	27	1,647.6	8,831.1	2,717	23	26,913	6.89	6.90	3.32	39.3
52 ... Montana	7	4	138.0	632.9	303	93	2,996	1.68	2.71	1.19	23.4
53 ... Nevada	3	6	518.5	2,760.7	302	3	16,330	7.57	7.60	4.13	39.3
54 ... New Mexico	9	14	1,799.7	8,147.1	1,418	36	26,448	7.17	7.39	3.19	36.1
55 ... Utah	3	10	243.7	2,401.6	640	1,019	7,863.9	2.43	2.31	1.61	18.1
56 ... Wyoming	3	10	243.7	2,401.6	640	1,019	7,863.9	2.43	2.31	1.61	18.1
57 ... TOTAL	34	75	7,233.1	34,797.5	2,820	1,371	107,008	5.70	5.70	3.14	37.7
PACIFIC											
58 ... California	8	40	15,368.7	74,364.9	-	19,921	193,892	-	-	2.01	37.4
59 ... Oregon	2	2	111.0	1.3	-	1	122	-	-	2.43	23.4
60 ... Washington	3	7	10,137.2	51,151.1	-	100	-	-	-	1.68	18.6
61 ... TOTAL	13	49	25,616.9	125,517.3	-	20,022	334,013	-	-	1.68	18.6
62 ... TOTAL UNITED STATES	393	718	193,660.2	879,036.7	284,367	130,931	3,443,977	5.76	5.80	2.86	36.1
63 ... CHAL-CONVENTION STATES 2/ 342	716	152,736.0	748,066.4	384,367	180,472	939,744	5.76	5.80	2.86	36.1	
64 ... CHAL-CONVENTION STATES 3/ 320	687	149,333.1	741,279.9	383,863	180,420	944,028	5.76	5.80	2.86	36.1	

1/ Regional and U.S. totals include some duplications, because some companies operate in more than one state. 2/ Maximum generation complete rating. 3/ Net generation, excluding steam use. 4/ Quantity and average Btu include 2,700,000 Mwh of artificial gas. Coal data are for 473,000 Mwh of natural gas. Gas data are for 33,000 Mwh of natural gas. Fuel data are for 33,000 Mwh of natural gas. 5/ Storage and average Btu values include







Continuously deliver pipe coal from seam and loads it on one operation.

## Production of Bituminous Coal, by States, 1930-1967.—All Types of Mines

		(Thousands of Net Tons)											Total from surface mines to end of 1965
	Maximum Production	Quantity	1939	1947	1950	1951	1962	1963	1964	1965	1966	1967	
Alabama	1936	21,001	12,047	19,048	13,011	12,915	12,000	12,350	14,435	14,832	14,219	15,300	
Arkansas	1907	2,670	1,152	1,271	609	705	256	221	212	225	236	245	
Colorado	1917	12,483	5,923	6,358	3,607	3,678	3,379	3,680	4,395	4,790	5,232	5,475	
Illinois	1918	95,291	45,780	67,000	45,877	45,746	48,487	51,736	55,023	58,483	63,571	65,200	
Indiana	1918	30,679	16,943	25,549	15,538	15,106	15,700	15,100	15,075	15,585	17,326	18,000	
Iowa	1917	8,906	2,940	1,684	1,068	927	1,180	1,213	973	1,043	1,025	900	
Kansas	1918	7,562	2,675	2,745	880	664	915	1,100	1,262	1,330	1,322	1,106	
Kentucky	1967	90,500	42,557	84,241	68,947	63,632	69,232	77,000	82,747	85,766	92,156	99,500	
Maryland	1907	5,533	1,443	2,051	748	757	821	1,122	1,136	1,210	1,222	1,250	
Missouri	1917	5,671	3,273	4,236	2,880	2,930	2,886	3,174	3,254	3,564	3,582	3,350	
Montana	1944	4,844	2,854	3,178	313	371	382	543	348	364	419	360	
New Mexico	1918	4,023	1,230	1,443	295	482	677	1,545	2,969	3,212	2,795	3,500	
North Dakota	1967	4,100	2,072	2,780	2,525	2,726	2,733	2,389	2,637	2,782	3,343	3,420	
Ohio	1920	45,878	20,289	37,548	35,957	32,226	34,125	36,790	37,310	39,390	43,541	45,800	
Oklahoma	1920	4,840	1,188	3,421	1,342	1,032	1,046	1,000	1,028	914	843	800	
Pennsylvania	1918	178,551	92,584	147,079	65,425	62,652	65,319	71,501	76,531	80,300	81,842	79,400	
Tennessee	1956	8,848	5,185	6,258	5,931	5,540	6,214	6,121	5,590	5,865	6,328	6,700	
Utah	1947	7,429	3,285	7,429	4,955	5,159	4,587	4,360	4,720	4,302	4,635	4,150	
Virginia	1967	37,508	13,531	20,171	27,838	30,332	29,471	30,951	31,054	34,053	35,585	37,900	
Washington	1918	4,582	1,692	1,115	220	131	225	120	88	55	50	50	
West Virginia	1947	176,157	108,362	176,157	118,944	113,670	119,489	132,568	141,499	149,191	140,181	152,500	
Wyoming	1945	9,847	5,373	8,051	2,004	2,819	2,589	3,124	3,101	3,289	3,670	3,650	
Other States			1,518	402	752	759	995	879	762	792	937	850	
Total	1947	630,621	334,835	630,624	415,512	402,577	422,140	458,579	486,999	512,005	533,881	551,000	

Source: U. S. Bureau of Mines.



New intensive beds string of zone from drift area.

## Coal Reserves of the United States

(Million short tons)

Overburden 0-3,000 feet  
Reserves determined by mapping and exploration  
Remaining resources in the ground as of Jan. 1, 1967\*

	Subbituminous coal	Anthracite and semi-anthracite	Lignite	Total	Estimated additional resources in unmined and unexplored areas † 0-3,000 ft. overburden	Estimated total remaining resources in the ground, 0-3,000 ft. overburden	Estimated resources in deeper structural basins 3,000-6,000 ft. overburden ‡	Estimated total remaining resources in the ground 0-6,000 ft. overburden
Alabama.....	13,516	0	29	13,535	20,000	33,536	6,000	39,536
Alaska.....	13,415	110,674	0	124,089	120,000	244,089	5,000	249,089
Arkansas.....	1,560	0	439	2,439	4,000	6,439	0	6,439
Colorado.....	62,369	18,248	0	80,715	146,000	228,715	145,000	373,715
Georgia.....	12	0	0	12	60	72	0	72
Illinois.....	129,756	0	0	129,756	100,000	229,756	0	229,756
Indiana.....	34,779	0	0	34,779	22,000	56,779	0	56,779
Iowa.....	6,519	0	0	6,519	14,000	20,519	0	20,519
Kansas.....	18,686	0	0	18,686	4,000	22,686	0	22,686
Kentucky.....	65,958	0	0	65,958	52,000	117,958	0	117,958
Maryland.....	1,172	0	0	1,172	400	1,572	0	1,572
Michigan.....	205	0	0	205	500	705	0	705
Missouri.....	23,360	0	0	23,360	23,350	46,710	0	46,710
Montana.....	2,299	121,877	87,525	211,701	157,000	368,701	0	368,701
New Mexico.....	10,760	30,715	0	41,475	27,000	68,475	21,000	89,475
North Carolina.....	110	0	0	110	20	130	0	130
North Dakota.....	0	350,000	0	350,000	100,000	450,000	0	450,000
Ohio.....	41,862	0	0	41,862	7,000	48,862	0	48,862
Oklahoma.....	3,293	0	0	3,293	20,000	23,293	10,000	33,293
Oregon.....	42	284	0	322	100	422	0	422
Pennsylvania.....	57,533	0	12,117	69,650	10,000	79,650	0	79,650
South Dakota.....	0	2,021	0	2,021	1,000	3,021	0	3,021
Tennessee.....	2,632	0	0	2,632	2,000	4,632	0	4,632
Texas.....	6,628	0	6,829	12,926	14,000	26,926	0	26,926
Utah.....	32,100	150	0	32,250	40,000	72,250	35,000	107,250
Virginia.....	9,712	0	0	9,712	3,000	12,712	100	12,812
Washington.....	1,967	4,194	117	6,278	30,000	36,278	15,000	51,278
West Virginia.....	102,034	0	0	102,034	0	102,034	0	102,034
Wyoming.....	12,659	126,011	0	138,670	325,000	463,670	100,000	563,670
Other States.....	1,031	4,467	446	6,444	1,000	7,444	0	7,444
Total.....	671,955	429,210	447,647	1,548,812	1,313,000	2,861,812	237,100	3,128,912

Figures are for resources in the ground, about half of which may be cross-bedded and recoverable. Includes beds of subbituminous coal and lignite 25 ft. or more thick, and more thick and beds of subbituminous coal and lignite 25 ft. or more thick.

\* By Paul Averitt, U.S. Geological Survey.

† Estimated from published records of the U.S. Geological Survey and individual State Survey records by production and reserve mining from date of estimate to Jan. 1, 1967. Lacks resources to be added to production.

‡ Estimates by G. H. Ashley (Pennsylvania), R. C. Seaton (Michigan), M. L. Corbett (Illinois), and A. M. Smith (Alabama, Florida, Georgia, and North Carolina). W. C. Cushman (Kentucky), R. A. Brown (Tennessee), G. R. Hays (Arkansas), E. R. Lando (Colorado and Texas), E. T. Lister (Tennessee), R. S. Nasson

(Oregon), F. C. Peterson (Knapptonville, Texas), J. A. Simon (Mississippi), A. V. A. Trumbull (Oklahoma), C. E. Wier (Indiana), and Paul Averitt for the remaining States.

\* Small resources of lignite included under subbituminous coal.

† Small resources of anthracite in the Perry River field believed to be too badly crushed and faulted to be economically recoverable.

‡ Small resources of lignite in basins generally less than 20 in. thick.

\* Arizona, California, Idaho, Nebraska, and Nevada. Bituminous coal in Black Mesa field, Arizona included under subbituminous coal.

† Arizona, California, Idaho.

‡ California, Idaho, Louisiana and Nevada.

Source: U.S. Geological Survey

## LATIMER DEPOSITION EXHIBIT 25

September 25th  
1964

Mr. R. J. Hepburn

## GRUNDY COUNTY, ILLINOIS

North of Morris there are approximately 3200 acres north of Interstate 80 and west of Illinois 47, which is indicated as No. 2 coal under the 75' overburden line. West of this the coal continues for one-half mile to a mile before the 100' overburden line is reached. I can find no ownership by any coal companies. This is very good farm land, but probably not quite as high value as that mentioned northwest of Ottawa.

In and around the town itself Sentry Royalty Company owns a considerable acreage consisting mostly of old strip pits formerly operated by the McElvains. This was acquired when Northern Illinois, Broken Arrow, Homestead, Sunlight and Wilmington Coal Mining merged with Sentry.

South of Morris the Sentry holdings are shown on the plat book and I can find nothing that they acquired since the merger. We have wondered why the old Northern Illinois pit stopped in Sections 17 and 20-33-7, and did not mine the coal between that line and the Mason River. I find that Northern Illinois showed several pieces in here when they were operating, but the tracts were all owned by people who also owned land in the old Northern Illinois area. All but one of these pieces were sold off and Sentry has only 40 acres in the SW $\frac{1}{4}$  of Section 18. This may indicate that the coal is either not there or not mineable.

East of Route 47 and west of the Mason River, there are approximately 1000 acres under 75' indicated and this can be increased by about 2460 acres by going to the 100' cover line. All of this is a moderate grade to good farm ground and over 50 owners are involved. There is another 640 acres north of and adjoining this

which is under 75', but it contains many small homes, a new subdivision and a cemetery and I don't think there would be much chance to get it. Adjoining this on the east side of the Mason River there are about 1500 acres of pretty good farms probably under 75' of overburden.

South of Morris, west of Route 47 in the only mineable coal shown under 75' is the Material Service gravel pit on which you already have a report from Bob Inman. South of this there is less than 1000 acres between 75' and 100' and I don't think you would want to try to mine it. Most of it is very poor grade, but it too is probably a future gravel pit.

There is no ownership by any coal companies that I can find other than that shown on the plat book.

T. H. LATIMER

THL/ah



## LATIMER DEPOSITION EXHIBIT 38

July 19th  
1966

Mr. R. H. Inman

As I understand it we are only planning to take up three of the options to lease we presently have. One of these, Tillery, must be renegotiated as his present contract covers 160 acres and we only want 40 of it. These contracts are as follows.

Tillery expires August 15th—160 acres—\$5440.00 payment \*

Allen expires September 1st—40 acres—\$1360.00 payment

Pollack expires September 24th—240 acres—\$8160.00 payment.

\* Renegotiate or drop

Exercising of any of these will make us liable to take up the Mason contract of \$42,350.00 on November 8th. This contains 182,000 tons.

As I have reported to you we are having very little success in taking up additional leases in the field. We are in an area of better and independent farmers who are tired of having optioned and will not take royalty contracts. Some of them also want an amount equal to a years taxes for permission to drill and will only grant short time options to purchase and higher prices, perhaps \$500.00 or more with the right to take other property in exchange instead of cash. They are difficult to deal with, but we might drop the Tillery contract and let him know we will try to make a deal on 40 acres later and this would give us until a week or so before September 1st to try to negotiate new contracts and drill them all out. Otherwise, I think we will have to drop the field.

T. H. LATIMER

THL/ah

cc: Mr. D. H. Emling



## LATIMER DEPOSITION EXHIBIT 48

February 10th  
1961

Mr. R. J. Hepburn

## HUNTSVILLE FIELD—SCHUYLER COUNTY

Rusty and I have covered this area pretty well, and as you have been informed, several of the land owners would like to option. While it is impossible to make an estimate of the field without drilling, judging from the many strip pits and outcrops, we should have options in each of the following sections:

3, 4, 5, 6, 7, 8, 9, 10, 11,  
14, 15, 16, 21, 22, 23, 28.

I do not mean that we should option the entire 10,240 acres at this time, but as people from each section come to us it would be well to have an option in each section. Should 60% of the area be coal bearing and under 80' of overburden, this would give a potential of 18,340,000 tons of coal.

North and west of Huntsville township there is also an area of perhaps 5,000 acres extending over to a point very close to the Burlington Railroad.

From the center of the Huntsville township field it is 7 miles air line to the Burlington on the northwest and 9 miles to the Wabash to the southwest.

T. H. LATIMER

THL/ah

cc: Mr. E. B. Campbell



GOVERNMENT  
SECURITY  
Mag. Rep.

## GENERAL DYNAMICS CORPORATION

340 PARK AVENUE, NEW YORK 22, N.Y.

November 24, 1959

### To the Share Owners:

Your proxy is being requested to vote in favor of the merger of Material Service Corporation of Chicago, Illinois, a leading Midwest producer and supplier of building materials, concrete, coal and limestone, into General Dynamics Corporation as the Corporation's Material Service Division.

The Directors of Dynamics believe that the merger of MSC into Dynamics is not only to the immediate and long-term financial advantage of the share owners, but serves well a basic corporate objective of Dynamics, namely, to generate commercial earnings that will balance earnings from defense projects.

### *Position of Dynamics in Defense*

Since the security of the nation is of paramount importance, the Directors of Dynamics are satisfied that large-scale defense activities must be a major and long term function of the American economy.

The Directors are equally satisfied that Dynamics will continue to contribute in large and important measure to the aircraft, missile, space, electronic and nuclear programs of this nation.

### *Position of Dynamics in Commerce*

Despite the long term needs of the nation's various defense programs, considerations of growth and stability dictate that a conservative corporate management actively seek diversification in commercial, non-defense business.

The Directors expect to achieve this diversification through development of commercial products stemming from present programs, such as: the Corporation's Convair 440/600 jet transports; Canadair's commercial turbo-prop CL-44 and CL-540 aircraft; General Atomic's nuclear research, maritime and power reactors; Liquid Carbonic's industrial gases; and Stromberg-Carlson's telephone and high fidelity sound equipment; and from the acquisition of companies which, because of technical capability, quality products and managerial competence, have demonstrated substantial earning power in industries basic to the nation's commercial future. The Directors are of the opinion that MSC is such a company.

### *Advantages of Merger to Dynamics*

Members of the Board of Directors and the Board of Management, after careful study and inspection of the organization, management techniques, properties, equipment and skills of MSC, believe that the earnings record of MSC is due to management competence, and to a high degree of mechanization of mines, quarries, plants and transportation equipment, resulting in comparatively lower-cost operations.

Dynamics would acquire an enterprise with an experienced management team of proven capability accustomed to operating under vigorous competitive conditions and with the most modern of extraction and transportation equipment, supplying basic materials to the steel, utility and construction industries.

The acquisition of a supplier of materials to the steel, utility and construction industries would give Dynamics basic participation in the expansion of the nation's physical plant and facilities to meet the demands of the growing economy and the accelerating population growth.

### 3. *Freeman Coal Mining Corporation:*

Freeman Coal Mining Corporation, an Illinois corporation and a wholly-owned subsidiary of MSC, operates directly or through a subsidiary 4 coal mines, namely, Crown Mine, Orient #3 Mine, Freeman Mine #4 and Orient #2 Mine, and has a fifth mine, Orient #5 Mine, under construction. All of such mines are located in Illinois. Each of the mines has an adjacent preparation plant. Effective as of the merger, all the coal reserves in and adjacent to each mine which are owned or controlled, directly or indirectly, by members of the families of Henry, Irving, Herman and Edward A. Crown ("Crown families") will be leased to Freeman on a royalty basis.

According to "Coal Age" for February, 1959, Freeman, with the production of these mines, ranked ninth among coal companies in the United States for tonnage produced in 1958. The production of these 4 mines in 1958 aggregated 6,872,541 tons, as follows—Crown Mine—1,578,623 tons; Orient #3 Mine—3,032,634 tons; Freeman Mine #4—1,071,377 tons; and Orient #2 Mine—1,189,907 tons.

The Crown Mine is located about 27 miles south of Springfield, Illinois, in Montgomery County. The coal reserves in and adjacent to this mine include a block of approximately 130 million tons of Number 6 seam coal, 6 to 8 feet in height and of relatively uniform quality. The sulphur content is approximately 3¼% and the BTU value is approximately 10,700 per pound. The estimated life of the deposit is approximately 70 years based on the rate of production in 1958. The coal produced by the Crown Mine is used principally for consumption by utilities. The most important contract for the sale of the Crown Mine's production is with one public utility. The lessor of the coal reserves is comprised of several trusts, the principal beneficiaries of which are members of the Crown families. The surface lands around the mine are owned by Freeman.

The Orient #3 Mine is located in southern Illinois. The coal reserves in and adjacent to this mine include a block of approximately 220 million tons of low sulphur, Number 6 seam coal, 7 to 12 feet in height. The sulphur content is about 1% and the BTU value is approximately 12,200 per pound. The estimated life of the deposit is approximately 65 years based on the rate of production in 1958. The lessor of the coal reserves is a wholly-owned subsidiary of The Chicago, Wilmington and Franklin Coal Company, a Massachusetts corporation, which is controlled by members of the Crown families.

The Freeman Mine #4 is located in southern Illinois. The coal reserves in and adjacent to this mine include a block of approximately 30 million tons of Number 6 seam coal, 6 to 7 feet in height. The sulphur content is about 2¾% and the BTU value is approximately 12,300 per pound. The estimated life of the deposit is approximately 20 years based on the rate of production in 1958. The lessor of the largest of the three leases covering the reserves of this mine is comprised of several trusts, the principal beneficiaries of which are members of the Crown families.

The Orient #2 Mine is located in southern Illinois. The coal lands are leased and cover a block of approximately 2,800,000 tons of Number 6 seam coal, approximately 8 feet in height. The sulphur content is about 1¾% and the BTU value is approximately 12,150 per pound. The lessor of the coal lease is a wholly-owned subsidiary of The Chicago, Wilmington and Franklin Coal Company. The surface lands around the mine are owned by Orient Number Two Coal Company, a wholly-owned subsidiary of Freeman. It is contemplated that the operation of this mine will be continued for approximately 18 months at which time it is anticipated Orient #5 Mine will be in operation.

The Orient #5 Mine is located in southern Illinois. This mine is under construction and will be in operation in approximately 18 months. The coal reserves in and adjacent to this mine include a block of approximately 32 million tons of Number 6 seam coal, 8 to 10 feet in height. The sulphur content is about 1¾% and the BTU value is approximately 12,150 per pound. The planned rate of production is 1,000,000 tons per year. If this rate is maintained, the life of the deposit is estimated to be approximately 20 years. The surface lands around the mine are owned by Freeman. There are 2 coal leases. The lessor under one of the leases is a wholly-owned subsidiary of The Chicago, Wilmington and Franklin Coal Company. The lessor of the other lease is comprised of several trusts, the principal beneficiaries of which are members of the Crown families.

The royalty rates provided for in the leases covering these 5 mines range from 7.5¢ to 13.1¢ per ton; only a minor portion of the tonnage is subject to a royalty in excess of 10¢ per ton. The

(c) As of October 31, 1959, MSC owned 231,503 shares of Common Stock (approximately 34% of the issued and outstanding shares of such stock) of The United Electric Coal Companies which shares will be acquired by Dynamics upon the merger.

(d) Forty-one stockholders of MSC, consisting of Henry, Herman, Irving and Edward A. Crown, of members of their families, of trusts of which certain members of their families are the beneficiaries, and of the Aric and Ida Crown Memorial, a charitable foundation of which Henry, Irving and Edward A. Crown are directors, own of record 74,323 shares of Common Stock of MSC, or over 97% of the 76,543 shares of such stock outstanding at October 31, 1959.

### REMUNERATION OF CERTAIN DIRECTORS AND OFFICERS OF GENERAL DYNAMICS CORPORATION AND OF MATERIAL SERVICE CORPORATION

#### General Dynamics Corporation

The following information with respect to the remuneration of Directors and officers of Dynamics for the year ended December 31, 1958 and with respect to the estimated annual benefits upon retirement of the persons named appeared in the Proxy Statement of Dynamics dated March 27, 1959, which was mailed to stockholders of Dynamics in connection with the Annual Meeting of Share Owners held on April 23, 1959:

The following tabulation sets forth the direct remuneration of each Director, and of each of the three highest paid officers, of Dynamics whose direct aggregate remuneration from Dynamics and its subsidiaries exceeded \$30,000 in 1958, and of all Directors and officers as a group, and the estimated annual benefits upon retirement of the persons named:

Name of individual or Monthly of group	Capacities in which remuneration was received	Aggregate remuneration for the fiscal year ended 12/31/58(\$)	Estimated net remuneration after current income taxes (c)	Estimated annual benefits under applicable retirement plan(d)
Frank Pace, Jr. ....	Director and President of the Corporation; Chairman of the Board and Director, Canadair Limited	\$ 104,167	\$39,385	\$66,900
Earl D. Johnson .....	Director and Executive Vice President of the Corporation; Vice Chairman of the Board and Director, Canadair Limited	126,750	55,487	35,400
Joseph T. McNamery (a) ..	Director and Senior Vice President of the Corporation; Consultant to the Corporation	88,200(a)	42,957	(a)
J. V. Naish (a) .....	Senior Vice President of the Corporation; President, Convair Division	105,750	50,348	31,700
All Directors and officers of the Corporation as a group (including the above named, but excluding assistant officers)		1,448,234	not applicable	not applicable

(a) Mr. McNamery retired as a Senior Vice President of the Corporation and as President of the Convair Division of the Corporation, effective March 31, 1958, and continued as a consultant. On April 25, 1958 Mr. Naish who had previously been Executive Vice President of the Convair Division, was elected a Senior Vice President of the Corporation and President of the Convair Division.

(b) Includes incentive compensation payments made in 1958 with respect to 1957 operations as follows: Mr. Johnson, \$40,000; Mr. McNamery, \$35,000; Mr. Naish, \$35,000; all Directors and officers of the Corporation as a group (including the foregoing, but excluding assistant officers), \$315,500. The Incentive Compensation Plans of the Corporation and Canadair Limited provide for the distribution of a maximum of 5% of the profits before taxes on capital employed, as defined in said Plans; persons eligible to participate are those employees of the Corporation or of Canadair Limited, respectively, who are mainly responsible for management operations.

(c) After Federal income taxes, assuming no other income during 1958, each individual being married, having two dependent children and filing a joint return, and 1958 tax rates.

(d) These estimates computed as of December 31, 1958 assume retirement at normal retirement age and include the amount of benefits provided by the individual's own contributions as well as those made by the Corporation.

(e) Mr. McNamery does not participate in the Retirement Plan of the Corporation, but, in addition to a consulting agreement, has a contingent deferred remuneration agreement under which he qualified on April 1, 1958 for additional compensation, provided that he complies with the conditions of his contract of employment. The amount of \$3,779 of such compensation was accumulated during 1958 through the date of Mr. McNamery's retirement, after which date no further accumulations were or will be made under said agreement. As of December 31, 1958 the unpaid balance of such compensation amounted to \$86,644, payable over a period of years at the rate of \$441 per month; upon death, any unpaid balance is payable to his beneficiary.

9/30/66

MAGUIRE DEPOSITION  
EXHIBIT 357. United Electric Coal Companies - Purchase of Stock

The Chairman referred to the discussions at the last Board meeting regarding the purchase of additional stock of United Electric Coal Companies. He reported that, as authorized by the Board, the Corporation had acquired 48,400 shares of UEC from Material Service Employees Profit Sharing Trust at \$50.50 a share, which represented the cost to the Trust of acquiring and carrying the stock.

The Chairman then stated that management had considered further the advisability of acquiring the remaining minority interest in UEC and, for various reasons, had concluded that the Corporation should proceed with a plan of acquisition at this time. He asked Mr. Sargent to present the management's views.

Mr. Sargent reviewed for the Directors the charts containing financial data on UEC which had been presented at the



Last Board meeting, and noted the amounts that would be required on various assumptions to acquire the remainder of the UEC stock. He stated that the management still felt that the most direct method of acquiring the balance of the UEC stock was through a combination of a tender offer for an additional 170,000 UEC shares, which would bring the Corporation's holdings to slightly more than 90%, and a "short form" merger, available under Delaware law to a 90% holder, under which any remaining minority would be paid the fair value of their shares. He stated that under the "short form" merger provisions, UEC could be merged directly into the Corporation or into a new Delaware subsidiary to which the Corporation would first transfer its UEC shares, in either case by action of the Board of the parent. He stated that if the tender offer were a success the merger would be effected as promptly as possible and steps would be taken to provide management for UEC and to combine UEC and Freeman marketing and other administrative functions and staffs where efficiencies and cost reductions could be achieved. He stated, however, that in the first instance the UEC coal properties and contracts would be held separately from those of Freeman, most probably in the new Delaware subsidiary.

Mr. Sargent then reviewed the various considerations in support of the management view that the minority interest in UEC should be acquired and that Freeman and UEC should be combined as soon as possible, including a review of UEC's limited coal reserves and the resulting problems UEC had encountered in obtaining and keeping long term contracts, the ability of Freeman to provide a back-up of reserves over the long term and finally



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The requirement for a new chief executive officer and other key personnel on which action should be taken promptly. He also reported that the New York Stock Exchange indicated its intention to delist UEC within the next few weeks. He stated that, in general, the combination of the two operations made good business and operating sense and would insure the ability of the enterprise to compete more effectively in its market. He stated further that, under all the circumstances, the Corporation's legal staff was not aware of any legal reason why the Corporation should not proceed with the plan.

The Directors discussed the matter of a tender offer price, in the course of which it was pointed out that it is normal in tenders of this kind to offer a premium over market of between 5% and 20%. Mr. Sargent then reviewed the market action of UEC stock over the last few months in which he noted that in July, when the possibility of a tender offer was first discussed, UEC was selling at 39-1/2, and that on August 3, the day before the meeting of the Board at which the tender offer was to be considered, the price of UEC had risen to 49. He stated that subsequent to the August meeting the price of the stock dropped sharply. The current market is about 42. Mr. Sargent then stated that, in his opinion, the Corporation should not, under present conditions, pay more than \$50 a share on the tender offer, which provided a sufficient premium over the market. The consensus of the Directors was that \$50 a share would be a proper offering price at this time.

Mr. Sargent answered questions by various Directors about the Corporation's cash position, the status of bank loans,

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the effective rate of interest being paid, compensating balances, and all other factors relating to the Corporation's ability to finance the tender offer and the payout to the minority stockholders on the "short form" merger. The remaining Directors were polled and, in view of the business considerations detailed by management, all concurred in the recommendation to proceed with the tender offer.

Mr. Sargent stated that, as he had noted earlier, on a Delaware "short form" merger, the minority are entitled to be paid the fair value of their shares, exclusive of any element of value arising from the merger. In the first instance the Corporation or the Board of the new subsidiary would set the price, and any UEC share holder objecting to the price could seek appraisal under Delaware law. He stated that management did not have a final recommendation on the price to be offered on the merger, but that he was certain that it would not exceed \$50 a share and might be less.

Mr. Sargent stated that it was proposed that Chase Manhattan Bank be designated as Tender Agent, that Georgesac & Co. be retained to assist on the tender offer and that a fee of 50 cents a share be paid to soliciting brokers. He then submitted to the meeting the proposed Invitation for Tender and Form of Tender and Assignment. He stated that these documents were substantially as submitted and reviewed at the August Board meeting, except that UEC earnings data for the first nine months of the year had been included. He stated that the documents had also been cleared with the New York Stock Exchange. The Chairman

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directed that copies of the proposed Invitation for Tender and Form of Tender and Assignment be filed with the records of the meeting.

Mr. Sargent stated that, in addition to authorizing the tender offer and related action, it would be appropriate at this time for the Board to authorize the management, in its discretion, to organize a new Delaware subsidiary, to transfer the UEC stock to such subsidiary and to take such other action as would be required to effect the "short form" merger on the basis proposed. He stated that it was expected that the definitive plan for the combination of UEC and Freeman would be developed in time to permit its consummation by the end of the year.

After further discussion, on motion duly made, seconded, and unanimously carried, it was

RESOLVED, that the Corporation make an offer (hereinafter in these resolutions called the Tender Offer) to purchase shares of Common Stock of The United Electric Coal Companies (hereinafter in these resolutions called UEC) by inviting tenders for such shares at a price of \$50 per share in the manner and on the other terms set forth in the instruments hereinafter in these resolutions approved; and further

RESOLVED, that the form, terms and provisions of the proposed Invitation for Tenders and the proposed Form of Tender and Assignment to be used in connection with the Tender Offer, copies of which have been submitted to this meeting, be, and hereby are, approved, with such changes therein as the President or the Vice President-Finance of the Corporation and Counsel for the Corporation may deem necessary or advisable and approve; and further

RESOLVED, that The Chase Manhattan Bank, N.A., be, and hereby is, designated as Tender Agent of

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the Corporation for the purposes of the Tender Offer; and further

RESOLVED, that the President, the Vice President-Finance or the Secretary of the Corporation be, and each of them hereby is, authorized to

(a) engage The Chase Manhattan Bank, N.A., as Tender Agent of the Corporation in connection with the Tender Offer;

(b) extend the termination date of the Tender Offer to such date (not later than November 21, 1966) as they or any of them shall determine;

(c) pay commissions or fees to brokers responsible for soliciting tenders of shares of Common Stock of UEC;

(d) retain solicitors to assist in connection with the Tender Offer;

(e) deliver to the Tender Agent such instructions as they or any of them shall deem necessary or proper in connection with the Tender Offer (which instructions shall designate the persons authorized to act for and on behalf of the Corporation in connection therewith); and

(f) take all such other action as they or any of them shall deem necessary, proper or advisable in connection with the Tender Offer and the implementation of these resolutions or any of them; and further

RESOLVED, that the President, the Vice President-Finance or the Secretary of the Corporation be, and each of them hereby is, authorized to take all such action, in the name and on behalf of the Corporation, as shall be necessary or proper to

(a) at such time as the Corporation shall own not less than 90% of the outstanding stock of UEC, cause UEC to be merged into the Corporation and, in connection therewith, set the terms and conditions of the merger (provided that the consideration to be paid for shares of UEC shall not exceed \$50 a share) and execute and file a certificate of ownership and merger, all in accordance with Section 253 of the Delaware General Corporation Law;

9/30/66

(b) form a new corporation under the laws of the State of Delaware (hereinafter called New Corporation);

(c) execute, in the name and on behalf of the Corporation, a subscription agreement with New Corporation providing for the purchase by the Corporation of all the authorized capital stock of New Corporation for not more than \$1000;

(d) as an alternative to the actions authorized pursuant to (a) above, transfer to New Corporation, as a capital contribution, all the shares of Common Stock of UEC owned by the Corporation (including, but not limited to, the shares of Common Stock of UEC to be purchased by the Corporation pursuant to the Tender Offer); and

(e) at such time as New Corporation shall own not less than 90% of the outstanding stock of UEC, cause UEC to be merged with and into New Corporation in accordance with Section 253 of the Delaware General Corporation Law upon such terms and conditions as said officers or any of them shall deem advisable, and in connection therewith to cause the Corporation to advance to New Corporation such funds as may be necessary to enable New Corporation to effect the terms of said merger.



# **CONTROL TECHNIQUES FOR PARTICULATE AIR POLLUTANTS**

**U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE**  
**Public Health Service**  
**Consumer Protection and Environmental Health Service**



experimental installation. Evaluation of the economic feasibility and effectiveness of this system must be deferred until after shakedown runs are complete.

Electrostatic precipitators - Electrostatic precipitators are the most common gas cleaning devices used to remove particulates from the flue gases of large stationary combustion sources. Such devices are capable of collection efficiencies of at least 99.5 percent, and it is quite possible that even more efficient systems can be provided if necessary. Electrostatic precipitator systems are usually applied to large pulverized coal-fired power boilers. The cost of these systems has limited their use on smaller combustion sources.

Electrostatic precipitators are highly sensitive, and if not properly designed, small changes in the properties of the particles and the gas stream can significantly affect their collection efficiencies.<sup>22</sup> Allowance should be made for possible changes in fuels, in fuel composition, and in gas temperature when consideration is given to the use of electrostatic precipitators. It has been established that low-sulfur fuels adversely affect the particulate collection efficiency of electrostatic precipitators designed for high-sulfur fuels.<sup>23</sup>

Fabric Filters - Fabric filters are not commonly applied to stationary combustion sources. Factors which limit the use of these devices are uncertainty of performance and reliability, and availability of other effective gas cleaning devices.

## MORRIS DEPOSITION EXHIBIT 3

December 17, 1959

Mr. J. M. Morris:

We have made another checkup or study on the amount of coal left in our Danville property. Producing as we are at this time, we estimate that our coal will run through the month of June. It is possible there will be some to take out after the miners' holiday, but it will depend on how the requirements of the light company are between now and then. If we come up to vacation time and it looks as if there is a small amount of coal left, we probably would be better off to work through the vacation period and complete it rather than go on vacation and then come back.

We have made a further study of the acreage just north of us on which we had hoped to pick up 250,000 to 300,000 tons of coal. In our previous drillings we had put some holes down for checking this possible amount of tonnage and evidently were unfortunate enough to have several of our drill holes go through some pillars. After plotting from an old map obtained of some underground workings and doing some additional drilling, we found that a considerable amount of what we thought could have been coal had previously been mined by underground methods. Taking this map, therefore, as being correct, and taking into consideration the gas line that crosses this property, there would be a small area of approximately eleven acres that could be mined without removing or moving the gas line, but to do this, box cut spoil would have to be thrown over the line and then leveled. This area, being of the nature it is, already congested with homes and businesses, would be very hard to mine without doing extensive reclamation and leveling. Taking for granted that the royalty we would have to pay for this coal would be offset by depreciation for an additional three months of operation, we theoretically should make 65¢ a ton on the one hundred thousand tons available. However, we would have to extend our power lines, drainage, a haulage road, and other incidentals, which could run easily \$15,000 to \$20,000, and we in operations feel that from a mining standpoint we should not consider mining this area and therefore have come to

the conclusion that the Danville mine will terminate as a strip mine the middle of the summer.

Another suggestion that we may have for Danville might be the purchase of the V-Day Coal Company, operated by Mr. Zamberletti. He has an underground operation across the hard road from our Mary Moore property which he has been mining as he desires during the winter months, producing No. 6 underground coal which underlies our Mary Moore property and the Peabody Estate property to our south, where we have removed the upper or No. 7 vein. This No. 6 vein underlies the No. 7 seam 30-35 ft. which we have not drilled out but which from some of our drill holes seems to have pretty fair cover, some shale and rock. Under our Mary Moore property there could be a million two hundred thousand tons in place and an additional eight hundred thousand tons in place under the Peabody Estate. Mr. Zamberletti has other coal leases, and south of him we know that U.S. Steel controls underground No. 6 coal. Mr. Zamberletti has been approached and I believe his property would be for sale. It might be well to take this up with Mr. Nugent. They can make an inspection for us and engineering-wise help us. It might be the thing to do to purchase this property to continue our Danville light contract. If we could get an estimate of what the underground cost might be, this coal could be trucked from the slope opening in our trucks to our plant to be crushed for loading on the C. & E.I. Otherwise it would have to be crushed in his plant and then trucked to the light company. If this could be put into operation, I feel a slope could be put on or near our property, which would shorten the overland road, maintenance and haul, and cut out the crossing of a highly traveled state route.

I would be glad to discuss this situation with you or Mr. Nugent at any time.

/s/ R. J. Hepburn  
R. J. HEPBURN

RJH:J

cc: Mr. F. F. Kolbe  
Mr. J. T. Murray

Mr. L. W. Barco—#25  
Mr. T. H. Latimer

## MOR. DEP. EXHIBIT 4

CC: Mr. T. J. Tarzy  
Mr. R. H. Inman  
Mr. J. T. Murray

January 10, 1966

Mr. Frank Nugent, President  
Freeman Coal Mining Company  
Division of General Dynamics Corp.  
300 West Washington  
Chicago, Illinois

Dear Frank:

Here's something that may be worth looking in to. You recall our sales agreement with Ruby, Chandler-Jordan on the production of the Ruby Mine. This was a strip—went into operation in 1953 and mined out all of the #11 strip in the area in 1961.

They control the underground #9 in the same area approximately 1200 acres which would mine out about six million tons of raw coal. Coal appears to be from 100 to 150 feet deep, average 4.75 feet thick, slate roof and good average quality #9 coal comparable to that mined by West Kentucky Coal Company now at their East Diamond property. This field joins the East Diamond workings.

The tippie, washing plant, shop, store house and office buildings are still there and about 10,000 feet of railroad track. All of the above are in good condition and the original cost of the plant and buildings was approximately \$500,000.00. For income tax purposes this was all charged out when the mine worked out the available acreage. So rather than re-open this tax case, the owners would sell to a prospective Lessee all of the above including land, for \$10,000.00.

While the mine is local on the Illinois Central Railroad, the market for coal with the TVA at present is better for L&N origin coal. A connection could be built with the L&N requiring about 2' miles of track, if you don't cross the IC. If permission could be secured to cross IC, there would not be over ½ mile of track necessary.

The present owners of the coal rights make the following offer: 20¢ per ton royalty on any coal sold at 3.25 per ton f.o.b. mine or less; six percent of the increase in price on coal sold above 3.25; thus, with a 3.50 realization royalty would be 21½¢, with 4.00 realization, 24¢.

Advance royalty of \$2,000.00 per month starting June 1, 1966, would be required; this to apply against earned royalty when mining commenced. Under the terms of their lease on this coal a slope must be started prior to May 1, 1966, to show good faith that coal is actually going to be produced and of course, the advanced royalty starts one month later.

Of course, for underground coal this royalty is rather high. Whether or not this is subject to negotiation, I don't know.

The six million ton reserves is not large, but with everything there, except underground equipment, necessary amortization might be such that over a 10 year period would justify operation.

Also, I have another coal field in mind which I think we can acquire and after we are through here, equipment that is movable could be put into production at the other spot.

It occurred to me that this might offer an opportunity to gain a foothold in the West Kentucky Field and while it is not exactly what we would want, still, it has some possibilities.

George Chandler, 400 Country Club Lane, Madisonville, telephone 821-3188, is the man to contact and Abe Moore, attorney, MOORE, MORROW & FRYMIRE, telephone 821-6165, handles their legal affairs.

If this appears interesting you can contact either one of the above and arrange for some of your people to investigate it further.

I will be leaving here tomorrow and should arrive at St. Pete sometime Thursday. My telephone number there is area code 813, 898-8868.

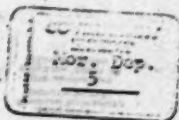
Best regards.

/s/ H.M.

/md



1682



THE UNITED ELECTRIC COAL COMPANIES

307 NORTH MICHIGAN AVENUE

CHICAGO, ILLINOIS 60601

March 14, 1966

BRANCH OFFICES  
ST. LOUIS, MISSOURI  
KANSAS CITY, MISSOURI  
PEORIA, ILLINOIS  
COMMERCIAL NATIONAL  
BANK BLDG.

J. H. MORRIS  
PRESIDENT

MAILING'S COVER  
FILED 179  
CUBA  
CUBA-EAST  
BART CHURCH  
BARTER

Mr. Frank Nugent  
Boca Raton Hotel & Club  
Boca Raton, Florida

Dear Frank:

I will see you next week but in the meantime wanted to bring you up to date on the No. 9 seam underground coal near Clay, Kentucky, about which I have given you some information.

Joe Davis, who owns this, is now in a frame of mind to discuss turning it over to some company like Freeman for a future mine on the property. In the meantime two oil companies have entered the scene and are making a determined effort to get control of the reserves. He realizes, however, that this is a long-range proposition and probably will not mean a coal mine in the foreseeable future.

He also is still discussing with both Georgia and Alabama Power a long-term contract but has not as yet been able to get the kind of freight rate on a volume basis that appears necessary.

The TVA has a bid opening on March 29 and he may put in a price on this. He is talking in terms of \$3.60 f.o.b. mine for raw No. 9 mine run, on which I am sure he can safely guarantee 11,900. This would be somewhat near recent award made to Bell & Zeller and might result in a contract. If he did get a contract, I think he would still be willing to discuss leasing the coal rights to someone else to operate.

I told him we were somewhat interested but it would take time to investigate and we would not commit ourselves until a thorough investigation and discussion could be had.

I will talk to you more about it when I see you.

Yours very truly,

*Johnnie*

JOHNIE



## THE UNITED ELECTRIC COAL COMPANIES

307 NORTH MICHIGAN AVENUE

CHICAGO, ILLINOIS 60601

May 3, 1965



MEMBER OFFICES  
ST. LOUIS, MISSOURI  
KANSAS CITY, MISSOURI  
SPRINGFIELD, MISSOURI  
CHICAGO, ILLINOIS  
ST. PAUL, MINNESOTA

MEMBER OFFICES  
PHILADELPHIA, PENNSYLVANIA  
CHICAGO, ILLINOIS  
ST. LOUIS, MISSOURI  
ST. PAUL, MINNESOTA

A. H. HARRIS  
President

Mr. Frank Nugent, President  
Freeman Coal Mining Corporation  
A Division of General Dynamics Corporation  
300 West Washington Street  
Chicago, Illinois 60606

Dear Frank:

The attached statement shows the strip coal reserves at our various properties at the end of our fiscal year July 31, 1959 and as of April 30, 1965.

You will note approximately 10,000,000 tons more as of now, and during that period we produced at all mines 27,508,006 tons. This indicates that during the past six years we have acquired a total of approximately 37,000,000 tons assignable to strip operations.

The reserves shown for Cuba Mine ... 2,004,370 tons ... includes the present pit of about 500,000 tons which will be mined out the end of this year. The balance of approximately 1,500,000 tons is in the No. 6 field near the Cuba tipple. We do not plan on going into this area until after mining out what we hope to acquire from Truax in their West Cuba field, which we estimate will keep us operating for some eight or ten years.

Assigned to the Southheart property is the following:

Present Southheart area	12,596,860 tons
South Southheart	11,256,275 "
North Canton field	17,518,924 "
	<u>41,372,059 tons</u>

If we complete our trade with Truax-Truax, because of the difference in overburden depths and thickness of coal seams, we will give up nearly 2,000,000 tons more in the North Canton area than we get back from them in the West Cuba field. Our reserves picture would then change by reduction in the 41,000,000 tons at Southheart and gain at Cuba, so our Southheart reserves will then total approximately 39,000,000 tons and our Cuba reserves approximately 8,000,000 tons. At an estimated 2,500,000 tons per year production at Southheart, we then would have about fourteen years life there and, as indicated above, from eight to ten years at Cuba.

1684

THE UNITED STATES COAL COMPANY

Mr. Frank Nugent

- 2 -

May 3, 1965

You will note we have been unable to add any strip reserves of any consequence at Fidelity. We show 25,000,000 + tons April 30, 1965 against 28,000,000 tons July 31, 1959. Fidelity production should average about 2,000,000 tons per year and the present strip area on this basis would last about twelve years.

At Banner we mined during this period about 3,000,000 tons and show 8,006,781 tons now against 5,700,000 in 1959, so we have added there roughly 6,000,000 tons in the last six years. We think Harry Kitaljerg has around 1,500,000 tons which we should eventually get. Banner's production of approximately 700,000 tons annually, if we get Harry Kitaljerg's property, would give us a life there of about thirteen years.

I thought these figures would be of interest to you.

Yours very truly,

JHN:W

## THE UNITED ELECTRIC COAL COMPANIES

COAL RESERVES (STRIP)

<u>Field</u>	<u>July 31, 1959</u>	<u>April 30, 1965</u>
Cuba	4,894,127	2,034,370
Fidelity	28,258,953	25,065,515
Clinch	971,068	781,200
Buckheart	22,311,761	12,596,860
South Buckheart	344,812	11,256,275
Mary Moore	323,530	19,215
Banner	5,698,357	8,006,781
North Canton - near Buckheart	8,231,630	17,518,954
Gayle - near Fidelity	1,714,710	1,714,710
Industry - No. 2 seam (Schuyler & McDonough Counties)	8,976,117	12,550,457
Buffalo Creek #2 - West Ky. #6	1,399,399	1,399,399
Oklahoma	2,301,872	2,301,872
East Liverpool	344,842	344,842
	<u>85,774,178</u>	<u>85,590,450</u>

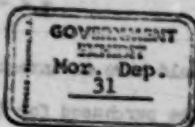
PRODUCTION AUGUST 1, 1959 THROUGH APRIL 30, 1965

Cuba	4,918,861
Fidelity	9,510,278
Buckheart	8,574,236
Mary Moore	1,427,934
Banner	3,072,697
	<u>27,503,006</u>

April 1965 tonnage estimated

NOT INCLUDED IN THE ABOVE: HAYDEN, COLORADO STRIP RESERVES, ESTIMATED AT 18,000,000 TONS, AND AN UNDETERMINED AMOUNT OF GUMMINGHOUSE COAL.

5/3/65



January 24, 1961.

Mr. J. N. Morris:

With reference to your memorandum of January 24 concerning the Industry-McDonough No. 2 coal field, we had as of July 31, 1960, under our control approximately 4700 acres, of which 3300 acres contained coal amounting to approximately 12 million tons. This area is shown in orange and is covered by purchase contract, and that shown in yellow is now owned by the Company. We are showing where we think this No. 2 coal may lie within the blue outlines of the accompanying map. You will notice that this covers quite a distance in area of some fifteen or twenty miles from our present field. This is due, of course, to the estimated depth of the coal that we figure without drilling might be stripped. Our estimate, of course, is based on the contours from the Geological Department of the State, and in checking our drilling on the property we own with the contours in that location, they check fairly close. We therefore assume that these contours would be fairly close in these other areas, but it would not be our final opinion that this depth is accurate until we could be in a position to option some of this land and drill it out.

At this time we are having in mind a large area which might constitute 40 to 50 million tons of coal. If we have in mind a field of this type we must realize, that we must have at least 20 thousand coal acres, which might consist of 30 to 35 thousand land acres. We must remember that for a mine of this type we would have to have several pits and no doubt several pieces of stripping equipment to maintain the production that might be desired. We feel that if all of this land were to be acquired, presuming that

the coal is there, we would have an investment of approximately \$200 an acre. Some of this land might be purchased for \$110 to \$150 an acre; some may run \$200 to \$250. You can see from this that we would eventually have an investment of five to six million dollars in land. If this were purchased under a royalty agreement, I think we would still have the same investment because you would have to guarantee a certain royalty. However, the cost to the Company in an operating mine would naturally be reduced. We probably would spend 15 to 20 thousand dollars at least just in acquiring options of this magnitude, and to properly drill this entire area would be an estimate of \$300,000. We figure that it would be \$        per acre.

We should keep in mind that the land that we now control has a ratio of approximately 20-25 to one, and we naturally would try to obtain the same ratio throughout the No. 2 coal field, if possible, but no doubt to obtain a large tonnage we might go up to 35 or 40 to one readily. We of course will have to get some options in locations other than our present vicinity and get a few drill holes down to give us a better idea.

Also shown on this map in blue color is the property that we understand has been optioned by Ayrshire Collieries. We do not know that they have taken these options but we do know they are active in this field. The outer perimeter or circle covers what we think might be the entire No. 2 coal field. We must understand that in areas now included in our blue lines the coal could be 150-200' deep.

COMMUNICATIONS  
Mor. Dep.  
32

February 24, 1960

Mr. T. J. Tarry  
Mr. J. M. Morris

Re: Springfield

With further reference to your information that the GIPS is very interested in building a power plant near Springfield if cheap coal is available, and asking if we could put anything together in any amounts or volume in this area:

We have done some drilling west of Springfield, which is deep coal, and our drill records do not show the best of roof conditions. However, I would want to check that with people more familiar with it than ourselves. I feel a considerable amount of tonnage could be put together as underground coal west and northwest of Springfield. We would, however, like to go a little further west to see the depth of the coal in that area.

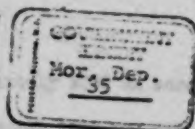
If you think an opportunity might come up, we might get an option further west and get some drill holes which will assist us in spreading out in that area.

R. J. Eptura

RJEJ

cc: Mr. R. H. Inman  
Mr. T. M. Latimer





July 17, 1962

Mr. J. M. Morris:

We are informed that there are approximately 12,200 acres of underground coal controlled by G. Stuart Jenkins of St. Louis located about six miles west of Greenville, Illinois. This is the No. 6 seam, having a thickness of 6-7 ft. and being approximately 350-400 ft. deep. We know nothing of the roof conditions nor have we seen any drill logs on this property, but it is for sale at \$35.00 per acre.

This immediately joins a Peabody area of approximately the same size that I believe they acquired twenty years ago. Two miles south of this location at Pechontas this coal was mined up to 1943 - the shaft being 420 ft. deep. Samples taken from this mine in 1921 by the Illinois Geological Survey show thicknesses of 6'8", 7'1", and 7'9", with the following analysis:

Moisture	11.9
Volatile	35.2
Fixed Carbon	42.2
Ash	10.7
Sulfur	3.4
B.T.U.	10,800

This is located between the Nickel Plate, the Burlington, and the Pennsylvania railroads, and Shoal Creek passes through the tract and might have water for a power plant.

I am wondering if you would want us to look into this and see what might be developed.

RJH:JJ

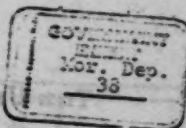
*Bad Rest*  
*40 feet - 7' soft*  
*stratigraphic*

J. J. Morris

*Morris Dep. Exp. 35*  
*10-1-68*  
*CBS*

1690

February 3, 1960



Mr. John Davis,  
Abraham Lincoln Hotel,  
Springfield, Illinois.

Dear Johnny:

Springfield County, Ill. (unsubsidized)

Sorry I have been so long in getting you some information on the drilling we did on your property. I do not have as yet an analysis from the outside concern. I will advise you of the analysis a little later on.

We did not get quite as many holes as we had hoped to due to weather and sickness. However, we did put down five holes, logs of which and a map are attached, showing the locations. From this drilling and from what coal we have found we feel that your farm would be underlain with the Springfield #5 coal, the seam averaging approximately 5'-10" in thickness. This coal should run in place 10,000 tons to the acre. By underground methods we figure 60% recovery at the present time, however, with good roof conditions and up-to-date equipment this recovery could be improved. However, we would figure there would be 6,000 acres recoverable tons per acre. Figuring your acres as being 847, which shows on the plat book, you would have around 8 1/2 million tons of coal in place, and between five or six million tons of washed coal.

While we are not actually in the deep mine business at the present time and are not too experienced in it, we are looking forward to the time when we are underground. From our experience and the drill holes it appears that your roof is not of the best, about 2 feet of slate and 1 foot of rock on most of the holes. A little further study would and should be made on a definite decision. We drilled 90 feet below the first seam of coal and found the #2 coal seam which, however, was very thin and would not be profitable to mine under any circumstances.

I will send you the analysis as soon as it arrives, and while I am not making an offer to you for the coal under your property today I would say that I am interested and I know that you certainly would give me an opportunity in case something would come up in the near future. We want to do some more testing in and around the vicinity and it is possible that we might want to give you an offer someday. I would appreciate it if you would keep this information to yourself and not give it to anyone else. As a rule we do not give the property owner this much information.

Yours very truly,

R.H. Hays

Vice President

cc: Mr. R. E. Dunn.

*Henry Dep.*  
*Feb 38*  
*CBS 10-1-68*

GOVERNMENT  
EXHIBIT  
Nor. Dep.  
42

# THE UNITED ELECTRIC COAL COMPANIES

307 NORTH MICHIGAN AVENUE

CHICAGO, ILLINOIS 60601

October 27, 1965

ST. LOUIS, MISSOURI  
CHICAGO, ILLINOIS  
CHICAGO, ILLINOIS  
CHICAGO, ILLINOIS  
CHICAGO, ILLINOIS

ST. LOUIS, MISSOURI  
CHICAGO, ILLINOIS  
CHICAGO, ILLINOIS  
CHICAGO, ILLINOIS  
CHICAGO, ILLINOIS

Mr. Frank Nugent, President  
Freeman Coal Mining Corporation  
A Division of General Dynamics Corporation  
300 West Washington Street  
Chicago, Illinois 60606

Dear Frank:

We doubt you kept a copy of report prepared by your Mr. J. L. Matheson, Jr. on cost estimates to try out underground mining at Fidelity. Estimates were as follows on total cost in trucks in the Fidelity pit:

300 Tons per Shift	\$3.077
400 Tons per Shift	\$2.610
500 Tons per Shift	\$2.385

The attached sheet shows costs accrued in trucks in the pit for the periods indicated.

Our fiscal year ended July 31, 1964 was the best in the history of the Company and Fidelity Mine was in very good stripping and operating conditions and achieved a cost of \$1.444 for that period. For the period beginning August 1, 1964 and ended December 31, 1964, you will notice a sharp increase in our total stripping cost from 67.14 to 89.09, and for the nine months ended September 30, 1965, we again went up sharply due to opening the new Green pit, increase in drilling and blasting, and the necessity for operating two machines while we were developing this new pit.

I think a fair estimate of total cost in trucks is probably around \$1.80 and this compares with the underground estimate, if we assume a middle-of-the-road basis of 400 tons per shift, of \$2.61 in truck. It would appear that a difference of 80¢ per ton is too much to justify trying this method.

We can discuss this further sometime at your convenience.

Yours very truly,

*Johanne*

JHh:W

Fidelity mine  
Analysis of Leads  
to put each in Truck

		Facial year total Trucks	5 Months Total 11/20/68	9 months Total 1/20/69	
<u>Shipping Leads</u>					
Unassigned		273	282	269	
Unassigned - Operation		270	275	269	
Unassigned - Maintenance		270	275	269	
Bleeding - Operation		112	121	122	
Shipping Leads - Operation		120	129	128	
Shipping Leads - Maintenance		270	275	269	
Other Shipping Leads		270	275	269	
Total Shipping Leads		167	170	167	
<u>In Leads</u>					
Shipping Lead		212	210	212	
Shipping - Operation		212	210	212	
Shipping - Maintenance		212	210	212	
Total In Leads		212	210	212	
Welfare Fund		287	288	287	
Overhead (4% of Total)		287	288	287	
Unassigned (4% of Total)		287	288	287	
Total Leads in Trucks		169	171	169	
October 20, 1968					
			9 months Dg. 64, 47-1		
			10-1-68		
C					756

## MOR. DEP. EXHIBIT 46

February 14, 1961

Memorandum to Mr. J. M. Morris:

Re: *TVA Bid—Ruby Underground #9 Seam Mine*

Since talking with you regarding our proposed bid to be opened February 14th, I have talked to both Frank Nugent and Edwin Ruby regarding this proposition.

We had originally planned to put in a contingent bid on a long-term basis to develop this underground coal after the strip mine was exhausted. Later, after discussing this matter further, we felt that it may be best to delay making a bid until the next opening, and, in the meantime we could proceed with an up-to-date cost study to investigate the feasibility of developing this property.

Edwin Ruby says that he would be ready to go into this matter with us at our convenience.

/s/ T. J. Tarzy

T. J. TARZY

cc: Mr. Frank Nugent

P.S. to Mr. Nugent:

I believe you have read the Davis Read report on this property made in 1954. This report showed that there is approximately 6 million tons of recoverable #9 seam coal underlying 1,206 acres controlled by the Ruby-Chandler, Jordan-Moore group.

We can give you a copy of this Davis Read report for your preliminary studies if you so desire.

TJT

1694

MOR. DEP. EXHIBIT 47

November 20th  
1957

Mr. G. I. Grasty  
Dixie Realty  
P.O. Box 4252  
Richmond Virginia

Dear Mr. Grasty:

Your letter of November 15th regarding coal lands in West Virginia and Kentucky has been referred to me, and I will be glad to receive full particulars and if possible, maps and any engineering reports you might have on both the coal in West Virginia and Kentucky. Before expressing any interest, it will be necessary for us to have as much information as possible on the names of the seams, thickness and quality of seam, actual areas of coal, in other words, a full and complete description of each property.

As you undoubtedly know, we are primarily engaged in stripping, but we are also interested in underground coal where mining and market prospects are attractive.

Very truly yours,

T. H. LATIMER

THL/ah

cc: Mr. R. J. Hepburn



MOR. DEP. EXHIBIT 55

April 26, 1965

Mr. John Morris  
President  
The United Electric Coal Companies  
307 North Michigan Avenue  
Chicago, Illinois 60601

Dear John:

I wonder if you would ask your Engineering Department to tell you where and how far the limestone is from the coal, and the thickness of the limestone, in the Round Perry Field.

It would also be helpful to know whether or not you have subsidence waivers. Possibly the Longwall System could be used in mining the coal.

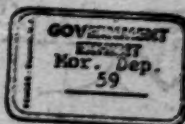
Yours very truly,

FRANK NUGENT  
President

FN/mf

1696

November 29, 1962



Mr. Robert S. Overbeck, General Manager  
Alumina Company of America  
1501 Alcoa Building  
Pittsburgh 19, Pennsylvania

Dear Mr. Overbeck:

It was a pleasure to meet with you and Phil Dorrance on November 14th to discuss our mutual interests in the coal reserves being put together in Perry County, Illinois.

In looking back through our files I find it was on September 1, 1960 that Mr. Morris, Mr. Sherrill and I met with the following Alcoa people:

B. J. Fletcher  
H. C. Erskine  
J. D. Harper

B. H. Sleane  
H. R. Althausen  
Roy P. Miller

and it was at this meeting that two of the subjects discussed were -

- (a) When Alcoa wishes to make use of the coal in Beaucoup Field for its own purpose, United Electric would like to have prior consideration for the mining operation on a basis to be decided on at that time, and
- (b) Should United Electric have the opportunity to make use of the coal in Beaucoup Field for a consumer other than Alcoa, for instance, an electric generating station, we would like for Alcoa to agree to allocate up to, say, 50 million tons, to United Electric for that purpose. A method of payment for the coal could be worked out at that time, and at the same time the area from which the coal could be produced would be designated.

The total tonnage in situ for the field should be well over 200 million tons.

In general these are the two areas in which there was agreement and we should like to have acknowledgment in writing that Alcoa concurs in this understanding.

We have also given some thought to the idea that Alcoa might like to lease up to 50 million tons to United at the present time in an area and at a price to be mutually agreed upon. Such an arrangement would permit United to include the tonnage as reserves. We shall appreciate your comments on this.

Again thanking you for your courtesy, and with kind regards.

Sincerely yours,

*Morris Dep.*  
54  
10-1-62

GWU:F

cc: Mr. J. H. Morris

Secretary



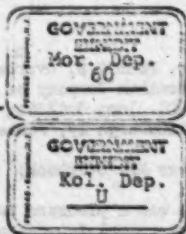
*Aluminum Company of America*

150 ALCOA BUILDING

RAW MATERIALS DIVISION

*Pittsburgh 19, Pa.*

December 13, 1962



Mr. G. H. Utterback  
Secretary  
The United Electric Coal Companies  
307 North Michigan Avenue  
Chicago 1, Illinois

Dear Mr. Utterback:

Thank you for your letter of November 29. As I informed you at our meeting on November 14, I am relatively green on the subject of past understandings between our two companies and, therefore, agree with you that any such understandings should be clarified for the future by an exchange of letters. Consequently, I have discussed your letter with those still available who were present at the meeting on September 1, 1960 and particularly with Mr. Roy F. Miller.

Generally speaking, Alcoa's purpose in going into the Beaucoup Field was to acquire a coal reserve in a favorable location with no strings attached. Keeping this in mind, we do not know of any commitments made by Alcoa to United Electric other than those spelled out in our written agreements, but we do acknowledge the follow understandings:

- (a) When Alcoa wishes to make use of the coal in the Beaucoup Field for its own purposes, United Electric will be given serious consideration for undertaking the mining operations on a basis to be decided on at that time, and
- (b) At any time that United Electric should come up with a specific proposition for leasing part of the coal in the Beaucoup Field, Alcoa is willing to consider seriously such a lease.

Although our wording of these understandings varies somewhat from yours, it represents our considered opinion of what was discussed at the meeting of September 1, 1960.

*Kolke sup. of. U*  
*10-28-68*

*and*

*Morris Dep. Ex 60*  
*10-1-68*

1698

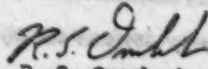
Mr. G. H. Utterback  
The United Electric Coal Companies  
December 13, 1962  
Page 2.

As regards the next to last paragraph in your letter, under Item (b) above, we will be glad to give serious consideration to any specific proposal that you might make at a time and place to be suggested by you.

We would appreciate your comments, but hope that the above is satisfactory and that you will confirm it in writing.

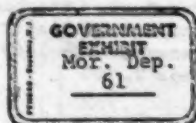
With best personal regards.

Sincerely yours,



R. S. Overbeck  
General Manager  
Raw Materials Division

RSO:jdk



May 17, 1965

To - Mr. E. H. Inman, General Superintendent

Subject - AGREEMENT - Aluminum Company of America - Perry County, Illinois.

On May 3, 1965 this Company entered into Agreement with Aluminum Company of America covering certain property in Perry County, Illinois, which agreement supersedes and replaces Agreement dated September 5, 1956, letter agreement dated August 20, 1957, another letter agreement dated January 27, 1960 and a third letter agreement dated March 23, 1960.

A copy of Agreement dated May 3, 1965 is attached for your information and files.

*[Signature]*  
Secretary

GHU:a

cc: Mr. J. H. Morris  
Mr. J. T. Murray  
Mr. T. H. Latimer

Attach.

*Morris Dep. Ex. 61  
(plus attachments)  
CBS  
10-1-68*

## AGREEMENT

WHEREAS, the relationship between ALUMINUM COMPANY OF AMERICA and THE UNITED ELECTRIC COAL COMPANIES, respecting certain property located in Perry County, Illinois, has been governed by a certain Agreement entered into by the parties September 5, 1956, and

WHEREAS, the said Agreement of September 5, 1956, has subsequently been amended by the letter agreement between the parties dated August 20, 1957, by another letter agreement dated January 27, 1960, and by a third letter agreement between the parties dated March 23, 1960, and

WHEREAS, the said parties to the above Agreement dated September 5, 1956, are desirous of both adding certain additional matter to this Agreement as amended and also of consolidating the above Agreement and its amendments into one document,

NOW, THEREFORE, THE UNITED ELECTRIC COAL COMPANIES, a Delaware corporation, having its principal office in Chicago, Illinois (hereinafter called "United") and ALUMINUM COMPANY OF AMERICA, a Pennsylvania corporation, having its principal office in Pittsburgh, Pennsylvania (hereinafter called "Alcoa"), intending to be legally bound, do hereby agree and covenant as follows in this AGREEMENT, made and entered into at Pittsburgh, Pennsylvania, this 3rd day of May, 1965.

1. United and Alcoa agree that this AGREEMENT shall supersede and replace the Agreement between the parties dated September 5, 1956, as amended by letter agreements dated August 20, 1957, January 27, 1960, and March 23, 1960, but shall not modify, alter, or release any of rights or duties which have heretofore arisen under the said Agreement as amended and which have not been fully performed or fulfilled.

2. In the course of performing the obligations contained in Articles 3, 4, 5, 6, 9, 10, 11, 12, 13, 14, and 15, and in all dealings with others not a party to this AGREEMENT, United shall act in its own name and without disclosing that it is acting for Alcoa.



3. United, acting in good faith and with reasonable diligence, shall undertake to obtain recordable and assignable options for the purchase of the coal and coal mining rights, together with all other available minerals and mineral and mining rights, in at least Eighteen Thousand (18,000) acres but not more than Twenty-Five Thousand (25,000) acres of land located east and north of Pinckneyville, Perry County, Illinois as outlined in red on the map marked "Exhibit A" and attached hereto, paying to the owner or owners of said land as consideration for each option so obtained the sum of One Dollar (\$1.00) per acre of land. United shall, insofar as is practicable, obtain said options in such a manner that the optioned tracts of land will be contiguous and constitute a solid block.

4. Until otherwise directed by Alcoa, each option so obtained shall be in the form marked "Exhibit B", attached hereto, and shall provide for payment of a total purchase price to the optioner or optioners not to exceed Fifty Dollars (\$50.00) per acre of land.

5. Whenever United, acting pursuant to the provisions of Article 3 hereof, shall be unable to obtain an option to purchase the coal underlying any tract or tracts of land within the area outlined in red on "Exhibit A", it shall undertake to obtain a recordable and assignable lease of coal and coal mining rights with respect to said tract or tracts of land in the form marked "Exhibit C" and attached hereto.

6. United shall without undue delay cause each option and each lease obtained to be recorded in the appropriate records of Perry County, Illinois.

7. Immediately after each option or lease has been recorded, United shall convey, assign, and deliver each such option or lease to Alcoa or to such other person or corporation as Alcoa shall in writing nominate or appoint, without recording such conveyance or assignment.

8. United does hereby acknowledge and declare that it will hold

the leases, options, deeds, titles, properties, and interests obtained pursuant to this AGREEMENT in trust for Alcoa; that it will continue to hold any leases, options, deeds, titles, properties, and interests obtained pursuant to the Agreement dated September 5, 1934, in trust for Alcoa; and that United will not claim to have any right, title, or interest in any of said leases, options, deeds, titles, properties, or interests.

9. Unless otherwise notified by Alcoa, United shall give extension notices as provided for in each and every option agreement, and at the same time, shall pay to the respective optioners the consideration required by the option agreements. The extension notices will be in such form as Alcoa may prescribe. At the time of delivery of the notice of extension and payment of consideration, United shall obtain the optioner's written acknowledgment of receipt of notice and payment of consideration.

10. Unless otherwise notified by Alcoa, United shall make annual payments as provided for in each and every lease obtained pursuant to Article 5 hereof, and at the same time, shall obtain the lesser's written acknowledgment of receipt of payment.

11. Upon Alcoa's request, United shall procure abstracts of title to the properties leased pursuant to Article 5 hereof, deliver these abstracts to title examiners designated by Alcoa, and assist in work reasonably necessary to curing any and all defects in the title to these properties.

12. Whenever Alcoa shall so request, United shall cause the optioned or leased properties to be properly drilled on approximately one-half mile centers and shall cause the cores to be examined and logged by a competent consulting engineer. United shall cause the coal samples to be analyzed by Commercial Testing Laboratory in Chicago, Illinois and shall promptly deliver to Alcoa the results of such analysis.

13. Unless otherwise notified by Alcoa, United shall take such steps as are necessary to exercising the options immediately prior to their

respective expirations and to taking good title of record to the coal and other interests previously optioned. In connection with the performance of this work, United hereby agrees to perform, upon Alcoa's request, such other work as is necessary or convenient to carrying out these purposes, such as but not necessarily limited to the procuring of abstracts, the delivering of these abstracts to title examiners designated by Alcoa, and the assisting in work reasonably necessary to cure any and all title defects. Thereafter, United shall convey these interests so obtained to Alcoa by deeds of special warranty without recording said deeds.

14. After United has conveyed the titles or assigned the leases to Alcoa as provided herein, United agrees that it shall continue to act as if it were the owner of all these interests so conveyed or so assigned until otherwise notified by Alcoa. In accordance with the foregoing it shall manage the properties, list the properties for taxes with the appropriate authorities, pay all taxes and charges accruing with respect thereto, and take any and all other steps as are reasonably incident to the ownership of the property and necessary to the maintenance of good title thereto.

15. Upon United's receiving notice of an application for a permit to prospect for oil and gas through any of the properties covered by this AGREEMENT, or on the surface above these properties, it promptly shall so notify Alcoa. Thereafter, United shall take such action with respect to preventing the issuance of a drilling permit to the applicant as Alcoa shall request.

16. On or before the tenth day of each month, United shall invoice Alcoa for, and Alcoa shall thereafter promptly pay, such charges as shall be due and owing to United by Alcoa on account of performance hereunder by United during the previous month. Such charges shall consist of the following:

A. Payments made by United to the optioner or optioners

- pursuant to the provisions of Articles 3, 9, and 13 hereof;
- B. Payments made by United to the lessor or lessors pursuant to the provisions of Articles 5 and 10 hereof;
- C. Payments made by United for salaries and wages of persons employed by United solely for the purpose of performing the agreements contained in Articles 3 and 4 hereof;
- D. Payments made by United for fees in connection with the recording of options and leases pursuant to Article 6 hereof, and with the recording of deeds pursuant to Article 13 hereof;
- E. Payments made by United to satisfy obligations imposed with respect to the properties held in accordance with Article 14, including but not necessarily limited to taxes and assessments imposed thereon;
- F. Payments made by United for fees in connection with objecting to the issuance of a permit to drill for oil and gas through the properties covered by this AGREEMENT, or on the surface above these properties, as may arise pursuant to the provisions of Article 15 hereof;
- G. An amount which is equal to one and one-half times the portion of the salaries of United's engineering and land acquisition employees which is attributable to United's performance of the agreements contained in this AGREEMENT on the basis of actual time spent by such employees in performance thereof;

- H. The actual cost to United of drilling, examination and logging of cores, and analysis of samples performed pursuant to Article 12 hereof; and the actual cost of procuring such abstracts as shall be purchased by United pursuant to Articles 11 and 13 hereof;
- I. Expenses incurred for meals, lodging, transportation, telephone and telegraph messages, engineering supplies and office supplies.
17. United shall, upon being so notified by Alcoa at any time, immediately cease, or temporarily suspend, the obtaining of other options, or leases, or both, pursuant to this AGREEMENT.
18. This AGREEMENT may be terminated by either United or Alcoa by giving thirty (30) days prior written notice of such termination.
19. In the event Alcoa decides not to extend any of the options, or not to exercise any of these options, or to abandon any of the leases acquired under this AGREEMENT, the said options or leases shall at the election of United be reassigned by Alcoa to United upon the reimbursement by United to Alcoa of all charges theretofore paid by Alcoa to United with respect thereto as provided in either Article 16 hereof or Article 6 of the Agreement dated September 5, 1956, or both, plus any payments made on any of said properties by Alcoa prior to September 5, 1956.
20. United has previously obtained and assigned to Alcoa certain options enumerated and described on Schedule A, attached hereto, covering lands lying only partly within the area outlined in red on Exhibit A. As to the options shown on Schedule A, notwithstanding anything to the contrary in other Articles of this AGREEMENT, United and Alcoa agree as follows:
- (a) Alcoa shall reassign to United the options shown on

Schedule A, and United shall hold each such option and cause it to be renewed, assigned, exercised or allowed to expire as herein provided.

(b) Until otherwise agreed to in writing by United and Alcoa, United shall cause each option shown on Schedule A to be kept in force by timely giving all renewal notices and paying all renewal charges therein allowed or required. When any such option is renewed and renewal charges have been paid by United as herein provided, United shall give Alcoa notice thereof, and Alcoa shall reimburse United for Alcoa's share of such renewal charges, which share is agreed to be the amount shown under "Alcoa Renewal Cost/Year" on Schedule A.

(c) If at any time either United or Alcoa shall desire that any such option be allowed to expire, it shall so notify the other in writing and the party receiving such notice shall, within 10 days thereof, in writing, notify the party giving such notice whether it agrees with or dissents from allowing such option to expire.

(1) If the notices of United and Alcoa agree that such option be allowed to expire, no renewal payment shall be made and the option shall be allowed to expire.

(2) If Alcoa gives United notice that Alcoa desires that such option be allowed to expire and United gives Alcoa notice that United dissents from allowing such option to expire, all rights of Alcoa in and to such option shall terminate and United shall thereafter hold such option for its sole account



and shall reimburse Alcoa for all option payments and renewal payments relating to such option for which Alcoa has reimbursed United pursuant to this agreement or pursuant to the agreement of September 5, 1955.

(3) If United gives Alcoa notice that United desires that such option be allowed to expire and Alcoa gives United notice that Alcoa dissents from allowing such option to expire, United shall cause such option to be renewed by timely giving all renewal notices and paying all renewal charges therein allowed or required. Forthwith after such renewal United shall assign such option to Alcoa and Alcoa shall reimburse United for the renewal payment made pursuant to the preceding sentence and for all option payments and renewal payments theretofore made by United on account of such option for which Alcoa has not reimbursed United.

(4) If, during the term, or any renewal term, of any option shown on Schedule A, either United or Alcoa shall desire the exercise of such option, it shall so notify the other, in writing, and the party receiving such notice shall, within 10 days thereof, in writing, notify the party giving such notice whether it agrees with or dissents from such exercise.

(1) If the party receiving notice agrees with the exercise, United shall proceed to exercise the option and complete the purchase of the land described therein. Promptly after the conveyance to United of the land

described in such option, United shall, by deed of general warranty, convey to Alcoa that portion of said land shown under "Alcoa Area Description" on Schedule A and Alcoa shall reimburse United for the purchase price paid by United for such portion.

- (2) If the party receiving the notice dissents from the exercise, United shall proceed to exercise the option and complete the purchase of the land described therein. If the option is exercised and the land purchased at the instance of United and without the assent of Alcoa, United shall acquire and hold the land at its sole expense and for its own account and shall reimburse Alcoa for all option payments and renewal payments relating to such option for which Alcoa has reimbursed United pursuant to the aforementioned agreement of September 5, 1936, or pursuant to this agreement. If the option is exercised and the land purchased at the instance of Alcoa, and without the assent of United, United shall, by deed of general warranty, promptly convey the land described in such option to Alcoa, and Alcoa shall reimburse United the total purchase price now provided in such option less the total of all option payments and renewal payments relating to such option for which Alcoa has reimbursed United pursuant to the aforementioned agreement of September 5, 1936, or pursuant to this agreement.

21. All notices and requests provided for in this AGREEMENT shall be in writing. Notices to United shall be deemed to be properly given

when deposited in the United States mail, registered and postage prepaid,  
addressed to:

G. H. Uterback  
Secretary-Treasurer  
The United Electric Coal Companies  
307 North Michigan Avenue  
Chicago, Illinois 60601

Notices to Alcoa shall be deemed to be properly given when deposited in the  
United States mail, registered and postage prepaid, addressed to:

A. E. Overbeck  
Aluminum Company of America  
1501 Alcoa Building  
Pittsburgh, Pennsylvania 15219

22. This AGREEMENT shall inure to the benefit of and shall  
be binding upon the parties hereto and their respective successors and  
assigns.

IN WITNESS WHEREOF the parties hereto have caused this  
AGREEMENT to be executed by their duly authorized officers.

Attest:

THE UNITED ELECTRIC COAL COMPANIES

G. H. Uterback  
Secretary

By

J. M. [Signature]  
President

Attest:

ALUMINUM COMPANY OF AMERICA

A. E. Overbeck  
Secretary

By

J. H. [Signature]  
Vice President

State of Illinois )  
 ) ss.  
 County of Cook )

I, R. A. Alderson, a Notary Public, do hereby  
 certify that on the 17th day of May, 1966,  
J. H. Morris, President and G. E. Utterback, Secretary, personally  
 appeared before me and being first duly sworn by me severally acknow-  
 ledged that they signed the foregoing document in the respective capacities  
 therein set forth and declared that the statements therein contained are true.

In witness whereof, I have hereunto set my hand and seal the  
 day and year before written.

(Seal)

R. A. Alderson  
 Notary Public

My commission expires  
 April 12, 1969

COMMONWEALTH  
 of )  
 Pennsylvania ) ss.  
 County of )  
 Allegheny )

I, Wendy L. Richardson, do hereby  
 certify that on the 11th day of May, 1965.

H. J. Morrison, Vice President, and Alfred M. Hunt, Secretary, personally  
 appeared before me and being first duly sworn by me severally acknow-  
 ledged that they signed the foregoing document in the respective capacities  
 therein set forth and declared that the statements therein contained are true.

In witness whereof, I have hereunto set my hand and seal the  
 day and year before written.

(Seal)

Wendy L. Richardson

WENDY L. RICHARDSON, Notary Public  
 Pittsburgh, Allegheny County, Penn.  
 My Commission Expires  
 April 2, 1969

SCHEDULE A

**UNDERGROUND COAL OPTIONS - BEAUCOUP &  
ROUND PRAIRIE FIELDS - PART ALCOA AREA  
PART UNITED ELECTRIC AREA**

Option No.	Optionor	Alcoa Acres	U. E. Acres	Alcoa Renewal Cost/Year	U. E. Renewal Cost/Year	Alcoa Area Description	U. E. Area Description
114 X	Louis, B. H.	40	40	\$ 40	\$ 40	NE 1/4, NW 1/4 Sec. 17-4S-2W	SE 1/4, SW 1/4 Sec. 8-4S-2W
123 X	Thompson, L.	130	20	130	20	SW 1/4, NW 1/4 except for 10 acres in SE Cor., and NE 1/4 SW 1/4 Sec., 16-4S-2W. NW 1/4 NE 1/4 and N 1/2 of NE 1/4 NE 1/4 Sec. 17- 4S-2W	W 1/2 SE 1/ SE 1/4 Sec. 8-4S-2W
127 X	Walenth, E. G.	90	40	90	40	Und. 1/2 Int. NE 1/4 SE 1/4, SE 1/4 NE 1/4 and S 1/2 NE 1/4 NE 1/4 Sec., 17-4S-2W. and NW 1/4 SW 1/4 Sec. 16-4S-2W	SE 1/4 SW 1/4 Sec 9-4S-2W
138 X	Bronke, J. F.	40	40	40	40	SE 1/4 NE 1/4 Sec. 14-4S-2W	SE 1/4 SW 1/4 Sec. 11-4S-2W
145 X	Gass, D.	40	40	40	40	SW 1/4 NE 1/4 Sec. 18-4S-2W	E 1/2, SE 1/4 SE 1/4 and S 1/2 NE 1/4 SE 1/4

MORRIS DEPOSITION  
EXHIBIT 62

MX-62 3147RT  
me  
Dr. Morris  
file

THE UNITED ELECTRIC COAL COMPANIES  
307 NORTH MICHIGAN AVENUE  
CHICAGO 6, ILLINOIS

September 12, 1960

RECEIVED  
MORRIS  
DEPOSITION  
EXHIBIT 62  
SEP 15 1960

BRANCH OFFICE  
ST. LOUIS, MISSOURI  
LOUISIANA AVE.  
CHICAGO, ILLINOIS  
COMMERCIAL BUILDING  
BANK BLDG.

J. H. MORRIS  
PRESIDENT

Mr. Frank Nugent, President  
Freeman Coal Mining Corporation  
300 West Washington Street  
Chicago 6, Illinois

Dear Frank:

Enclosed is copy of letter from Ray Miller  
of Alcoa which I thought you would like to see.

In line with our recent discussion, it appears  
worth while to make a study of possible investment and  
cost per ton that might be achieved in an underground  
mine on the coal acreage that has been acquired by the  
Aluminum Company.

There is, of course, no hurry about this  
but whenever you would like to do it, please let us  
know what information is needed and we will supply it.

With kindest regards,

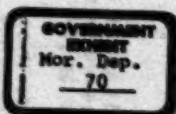
Yours very truly,

*Johnnie*

JHM:EM



1713



June 11, 1962

*Morris Dep. Ex. 70*  
*Chs* *10-1-68*

Mr. Francis Stanley Jordan  
37 Jefferson Avenue  
Short Hills, New Jersey

Dear Mr. Jordan:

This will acknowledge yours of June 7. Permit me to welcome you as a stockholder in our company and we appreciate your interest as expressed concerning recommending the purchase of United Electric stock for some others.

For our fiscal year ended July 31, 1961, approximately 62% of our sales was to the utilities. For our current year ending July 31, 1962, we anticipate this will increase to 70% or maybe slightly more.

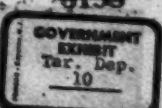
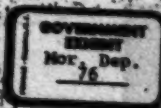
We continue to share in the growth of the utility industry. Most of our utility customers are under long-term contracts with us, varying in number of years. All of these contracts carry escalation clauses covering changes in wage rates, costs of materials and supplies, hours of work per day or week, and changes in Federal or State laws having a direct effect on production costs.

We do not have any serious competition in the Midwest from oil for use in industrial and utility plants. We do have severe competition from natural gas when it is dumped at low prices during the summer months when there is no heating load. We feel, however, that with our mining methods and transportation costs, we can continue to hold our position with this competition. It is expected that with the diminishing reserves of gas and the possible higher prices, our competitive relationship with this fuel will improve.

We are glad to hear from you and if any further information is desired, please call on us.

Sincerely,

JORDAN



February 12, 1961

Mr. J. E. Currier

Re: Atlantic Power, Vermilion-Benville Power Plant

In recent discussions with Arch Krachovik, he mentioned that they are seriously considering the matter of obtaining the coal that they use adjacent to their Vermilion power plant.

He stated that they have estimated that there is 2,000,000 tons that could be stripable in this area and that Archway had made them a proposition to strip this coal for them at a certain cost and deliver it to their power plant.

Arch recalled that we went into this situation some time ago and he would like to have us carry our efforts along this line and come up with a cost and delivered figure for this to this coal.

I have mentioned this to Bob Ryburn and I am sure you will want to discuss it with him on your return to the office and then contact Arch about it.

J. J. Fawcett  
*J. J. Fawcett*

cc - Mr. R. V. Ryburn

*Fawcett*  
*10*

1715

*Dix* *Ex. 1, ID*  
*4/14/69*

GENERAL SERVICES ADMINISTRATION  
FEDERAL SUPPLY SERVICE

TERM CONTRACT ORDERING DATA FOR:

FSC Group 91 Fuels }  
FSC Class 9110 — Coal }

Veterans Administration  
Facilities  
(Schedule 1)

&

Federal Public Buildings  
(Schedule 2)

Within the states of:  
Illinois, Indiana, Kentucky, Michigan, Ohio & Wisconsin

GEOGRAPHIC COVERAGE:



Effective Period:

Date of Award through June 30, 1968

IMPORTANT NOTICE

In addition to the "Special Provisions" below, Contractors listed herein are subject to the provisions of the following forms, which are a part of the Contract:

- (a) General Provisions (Supply Contract) Standard Form 32, June 1964 Edition.
- (b) Standard Form 33 & 33A, December 1964 Edition.
- (c) Supplemental Provisions, GSA Form 1624, September 1964 Edition.
- (d) R5 Form T288, October 1965 "Equal Opportunity."
- (e) Special Provisions Applicable to Coal Contracts dated March 9, 1951.

SCOPE OF CONTRACT

This schedule provides for the normal supply requirements of the installations specified herein, and contracts will be used as primary sources for the articles or services listed herein. Articles or services will be ordered from time to time in such quantities as may be needed. As it is impossible to determine the precise quantities of different kinds of articles and services described in the schedule that will be needed during the contract term, each Contractor will be obligated to deliver all articles and services of the kinds contracted for that may be ordered during the contract term, EXCEPT:

- (A) EXIGENCIES: In cases of exigency. (Subject to audit by the General Accounting Office.)
- (B) URGENT REQUIREMENTS: To the extent that a contractor is unable to meet the bona fide delivery requirements of ordering activities STIPULATING DELIVERIES SHORTER THAN THE CONTRACT DELIVERY TIME. Delivery requirements are defined as actual needs of the ordering office which require the articles or services must be delivered in the total quantity required by the date required. When the contract delivery time does not meet delivery requirements and the ordering activity determines that time permits, the Contractor shall be requested by letter, telegram or telephone (confirmed in writing) to state the best delivery time of which he is then capable. The Contractor shall reply to such inquiries in kind not more than 3 working days after receipt. Orders placed on the basis of a shorter delivery time agreed to shall be delivered within this shorter delivery time and in accordance with all other terms and conditions of the contract.

SPECIAL REQUIREMENTS

Where an agency included under Scope of Contract Provision finds that the specific articles or services listed herein will not meet a special requirement, articles or services having the same general characteristic needed to meet the special requirement may be procured; Provided, that a prior written waiver of the requirement for using this schedule is obtained from the General Services Administration. Requests for such waivers shall be submitted to the contracting office at the address shown on the face of the Schedule. Such requests shall (a) describe the pertinent differences between the articles or services listed herein and those required, (b) specify the quantities required, and (c) state the reasons why the articles or services listed herein will not meet the requirement.

(Continued)



SUPPLEMENTAL & SPECIAL PROVISIONS

**PURCHASE ORDERS:** Purchase or delivery orders will be issued to the coal contractor by the activity concerned in accordance with the schedule. Upon receipt of a purchase or delivery order, the contractor shall furnish the coal specified in the schedule in accordance with the provisions of the contract and in compliance with the instructions set forth in the order. The order should indicate to which office the contractor's invoices are to be submitted for payment. If the coal is to be shipped in a certain type of railroad car or delivered by a designated railroad to a particular yard or siding, such information should be furnished the contractor.

**RAIL DELIVERIES:** When necessary to meet unloading conditions, the government reserves the right to require shipments to be made in the type of transportation equipment it may specify and to reject shipments proffered in other types of equipment.

- PRICES:**
- (a) Prices "FOB MINE (CARS)" - Free on Board Cars, at the mine or at the water front dock.
  - (b) Prices "FOB DESTINATION (Tracks)" - Includes transportation costs to rail siding at destination. Drayage from railroad siding to bin to be arranged by ordering office.
  - (c) Prices "DELIVERED INTO BINS" - Includes delivery into the bins at the using activity without additional cost to the government.

**\*Seller's Invoices:** Paragraph 11 of Standard Form 33-A is hereby corrected to read "Invoices shall be prepared and submitted in original only, etc., in lieu of 'in Quadruplicate.'" The rest of the paragraph remains the same.

SPECIFICATION

The Federal Activity and destination (delivery), the size of coal, the analytical constituents (limits) and estimated tonnage, by item numbers, are given in the Schedule. The sizes specified are based on round hole screen. Unless otherwise specifically stated for an item, the coal is for use as fuel in heating or steam generating plants. Coal which is unduly friable, oxidized, non-caking or non-coking, will not be acceptable.

SUPPLEMENTS TO SPECIAL PROVISIONS APPLICABLE TO COAL CONTRACTS DATED MARCH 9, 1951.

**"PRICE REVISION - OTHER THAN RETAIL"** - Paragraph 10 is supplemented as follows:

"The aggregate of the increases in any unit price made under this paragraph shall not exceed 10 percent of the original applicable price."

**"PRICE REVISION - RETAIL"** - Paragraph 11 is supplemented as follows:

"The aggregate of the increases in any unit price made under this paragraph shall not exceed 10 percent of the original applicable price."

**"VARIATION OF TONNAGE"** - Paragraph 12 is supplemented as follows:

"Unless otherwise specified, any variation in the quantities called for in any order, not exceeding 10 percent, will be accepted when caused by conditions of loading or shipping."

(Continued)

Effective Period:

Date of Award through June 30, 1954

VETERANS ADMINISTRATION FACILITIES(SCHEDULE NO. 1)ADDITIONAL REQUIREMENTS AND SPECIFICATIONS

Contractors who received awards on a delivered and stored basis will be required to place the coal on the stockpile or into coal hoppers as required by the installation.

On awards made f.o.b. mine, movement by rail will be made on commercial bills of lading, which will be converted to Government bills of lading at destination. Further instructions will be furnished in notices of acceptance and in purchase orders placed under the contracts.

(Continued)



VETERANS ADMINISTRATION FACILITIES  
(SCHEDULE NO. 1)

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Page 4

Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered Guaranteed Analytical Limits	Price Per Ton FOB	Contractor
1.	ILLINOIS Vet. Adm., Danville, Ill. 1900 E. Main St.	520 Tons - Aug. 610 " - Sept. 965 " - Oct. 1155 " - Nov. 1385 " - Dec. 1900 " - Jan. 1575 " - Feb. 1375 " - Mar. 1050 " - Apr. 625 " - May 550 " - June 11710 " Total	3/4" x 1/4" PSI - No. 5 Max.  Moisture as Received - 14.0% Max. Volatile, Dry - (No Limit) Ash, Dry - 6.0% Min. - 12.0% Max. Sulphur, Dry - 3.1% Max. B.T.U., Dry 12,800 Min. A.S.T. 2,000 <sup>00</sup> Min.  STRICTLY ADHERE TO SIZE	\$6.00 Bin Delivered	Pontreas Coal Corp.

(Exception to Para. 4C of Special Provisions, Applicable to Coal Contracts - ALL TRUCK DELIVERIES WILL BE WEIGHED ON GOV'T OWNED SCALES AND WEIGHTS SO DETERMINED; SHALL BE BASIS OF SETTLEMENT.)

(Continued)

VETERANS ADMINISTRATION FACILITIES  
(SCHEDULE NO. 1)

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Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered Guaranteed Analytical Limits	Price Per Ton FOB	Contractor
2.	ILLINOIS (Cont'd) Vet. Adm., Hinsdale, Ill. Bldg. 142, West Broadview, Ill. Delivering Carrier IC R.R. Triple Hopper Cars Required Activity has its own siding. Essential Routing FOB Mine Shipment AWW - SOU - IC AWW - SOU - MONON - IC Delv. AWW - SOU - C & EI - IC Delv. AWW - NYC SYSTEM - IC Delv. AWW - SOU - PRR - IC Delv. SOU - MONON - IC Delv. Est. Rate: \$3.07 (1000 Tons) Per Ton \$3.57 (Single Car) Per Ton	1100 Tons - Aug. 1100 " - Sept. 2300 " - Oct. 3400 " - Nov. 4400 " - Dec. 13300 " Total	1-1/4" x 1/4" Stoker - Fine Moisture As Received - 12.0% Max Volatile Dry (No Limit) " " Ash, Dry " " Sulphur, Dry " " B.T.U., Dry 12,500 Min. A.S.T. 2,100°F Min.	\$4.35 Min	Essex Coal
OIL TREATMENT REQUIRED DURING MONTHS OF NOVEMBER, DECEMBER					
3.	Vet. Adm., Marion, Ill. Activity does not have its own siding. Bin Capacity - 200 tons	170 Tons - Oct. 250 " - Nov. 300 " - Dec. 320 " - Jan. 290 " - Feb. 290 " - Mar. 200 " - Apr. 100 " - May 1,920 " Total	1" x 10" Mesh 25% Maximum three 1/4" Round Hole Screen Oil Treated Moisture as Received - 10.0% Max. Volatile, Dry (No Limit) " " Ash, Dry " " Sulphur, Dry " " B.T.U., Dry 12,800 Min. A.S.T. 2100°F	\$5.55 Bin Delivered	Bell & Zeller Coal Co.

(Continued)

VETERANS ADMINISTRATION FACILITIES  
(SCHEDULE NO. 1)

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Page 6

Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered Guaranteed Analytical Limits	Price Per Ton FOB	Contractor
4.	INDIANA				
	Vet. Adm., Marion, Ind. 38th St., Home Ave. (Hort. Siding)	600 Tons - Aug. 1900 " - Sept. 2000 " - Oct. 2000 " - Nov. 500 " - Dec. 1200 " - Mar. 1000 " - Apr. 800 " - May 500 " - June 10,500 " Total	1" x 1/4" Oil Treated Moisture as Received - 12.0% Max. Volatile, Dry (No Limit) Ash, Dry - 12.0% " Sulphur, Dry - 4.0% " B.T.U., Dry 12,600 Min. A.S.T. 2,050°F	\$4.40 Mine	Encs Coal Sales Div.
	Open Storage - Unlimited Capacity				
	Activity has its own siding Hopper Cars Required Delivering Carrier, NYC RR Rail Delivery				
	<u>Suggested Routings for Mine Shipments</u> AWW - NYC AWW - NYC - N & W Frt. Rate: \$2.38 Per Ton				
5.	KENTUCKY				
	Vet. Adm., Lexington, Ky. 569 S. Broadway, Southern RR 600 West Vine & Patterson Sts. LAN RR 123 Ross St., CAO RR Activity does not have its own siding. Bin capacity - 250 tons; outside storage lot - concrete slab - 2000 tons capacity	550 Tons - Aug. 350 " - Sept. 550 " - Oct. 600 " - Nov. 650 " - Dec. 750 " - Jan. 650 " - Feb. 700 " - Mar. 500 " - April 500 " - May 350 " - June 3,950 " Total	1-1/4" x 1/4" Oil Treated Moisture as Received - 6.0% Max. Volatile, Dry (No Limit) Ash, Dry - 8.0% " Sulphur, Dry - 1.5% " B.T.U., Dry 13,600 Min. A.S.T. 2,400°F	\$10.09 Bin Delivered	Scotts Coal Co.

(Continued)

VETERANS ADMINISTRATION FACILITIES  
(SCHEDULE No. 1)

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Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered Guaranteed Analytical Limits	Price Per Ton FOB
<b>KENTUCKY (Cont'd)</b>				
6.	Vet. Adm., Louisville, Ky. Zorn & Melwood Activity does not have its own siding. Bin capacity 165 tons	350 Tons - Oct. 350 " - Nov. 450 " - Dec. 500 " - Jan. 400 " - Feb. 400 " - Mar. 350 " - Apr. 350 " - May 300 " - June <u>3,450</u> Total	3/4 x 28 M Not exceeding 25% thru 1/4" Round Hole Screen  Moisture - 8.0% Max. Volatiles, Dry (No Limit) Ash, Dry - 8.0% Max. Sulphur, Dry - 3.5% Max. B.T.U., Dry 13,000 Min. A.S.T. 2,100°F Min.	\$7.69 Bin Delivered  "Charles Buddake Coal Co.
7.	Vet. Adm., Ft. Thomas, Ky. 29 Bin capacity - 652 tons Outside coal pile capacity - 300 tons. Activity does not have its own siding.	28 Tons - July 178 " - Aug. 153 " - Sept. 70 " - Oct. 141 " - Nov. 173 " - Dec. 171 " - Jan. 141 " - Feb. 127 " - Mar. 35 " - April 35 " - May 25 " - June <u>1,280</u> Total	1" x 1/4" Oil Treated   Moisture as Received - 10.0% Max. Volatiles, Dry (No Limit) Ash, Dry - 10.0% " Sulphur, Dry - 1.5% Min. B.T.U., Dry 13,700 " A.S.T. 2,200°F "	\$10.35 Bin Delivered  Atlas Coal & Blacktop

Truck delivery to storage points located at approximately 30 locations. Contractor should maintain a reserve supply sufficient to make deliveries as required.

ORDERS FOR THIS STATION WILL BE PLACED BY THE VA HOSPITAL, CINCINNATI, OHIO

(Continued)

VETERANS ADMINISTRATION FACILITIES  
(SCHEDULE NO. 1)

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Page 5

Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered	Price Per Ton FOB	Contractor
8.	MICHIGAN  Vet. Adm., Ann Arbor, Michigan 2215 Fuller Road (Ann Arbor & NYC RR)  No rail siding at activity. Inside overhead bunker. Capacity 150 Tons Outside concrete storage capacity - 900 Tons	200 Tons - Oct. 350 " - Nov. 425 " - Dec. 490 " - Jan. 450 " - Feb. 400 " - Mar. 375 " - Apr. 200 " - May 3,790 " Total	1-1/4" x 1/4" Stoker Oil Treated  Moisture as Received - 5.0% Max. Volatile, Dry (No Limit) Ash, Dry " - 0.0% " Sulphur, Dry " - 2.0% " B.T.U., Dry 13,800 Min. A.S.T. 2,400 <sup>00</sup>	\$11.27  Bin Delivered Guyana \$1	Island Creek Coal Sales Co.
9.	Vet. Adm., Battle Creek, Mich. Pl. Custer, Battle Creek, Mich. (Delivery-carrier NYC RR) Coal pile capacity - 250 Tons Yard storage capacity - 7,000 Tons Rail delivery  50-70 Ton Hopper bottom cars required. Activity has its own siding.  Suggested Routings for Mine Shipments: C & O - NYC C & O - AA - NYC C & O - NYC (M) Pri. Rate: \$4.97 Per Ton	1000 Tons - July 1000 " - Aug. 1000 " - Sept. 1000 " - Oct. 1000 " - Nov. 1000 " - Dec. 1000 " - Jan. 1000 " - Feb. 1000 " - Mar. 1000 " - Apr. 300 " - May 10,300 " Total	1-1/4" x 1/4" Stoker Oil Treated  Moisture as Received - 6.0% Max. Volatile, Dry (No Limit) Ash, Dry " - 7.0% " Sulphur, Dry " - 2.5% " B.T.U., Dry 13,500 Min. A.S.T. 2,400 <sup>00</sup>	\$5.45  Mine Guyana \$1	Island Creek Coal Sales Co.

(Continued)



VETERANS ADMINISTRATION FACILITIES  
(SCHEDULE NO. 1)

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Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered Guaranteed Analytical Limits	Price Per Ton FOB	Contractor
10.	<b>MICHIGAN (Cont'd)</b> Vet. Adm., Iron Mountain, Mich. (Delivery carter - Milwaukee RR) Bin capacity - 200 tons Outside concrete platform capacity. Activity has its own siding.	191 Tons - Aug. 211 " - Sept. 346 " - Oct. 314 " - Nov. 437 " - Dec. 500 " - Jan. 420 " - Feb. 385 " - Mar. 310 " - April 270 " - May 207 " - June <u>3,491</u> " Total	3" x 1/4"  Moisture as Received - 8.0% Max. Volatile, Dry (No Limit) - 10.0% Ash, Dry - 1.7% Sulphur, Dry - 13.300 Min. B.T.U., Dry - 2,400 Btu. A.S.T.	\$12.40 Bin Delivered	C. Reiss Coal Co.
11.	Vet. Adm., Saginaw, Mich. Weiss Street Team Track, Saginaw, Mich. (C & O - PM or GTW RR) Coal silo capacity - 250 Tons Activity does not have its own siding.	200 Tons - Nov. 100 " - Dec. 300 " - Jan. 300 " - Feb. 30 " - Mar. <u>930</u> " Total	1-1/4" x 1/4" Oil Treated  Moisture as Received - 5.0% Max. Volatile, Dry (No Limit) - 10.0% Ash, Dry - 1.5% Sulphur, Dry - 13.300 Min. B.T.U., Dry - 2,400 Btu. A.S.T.	\$12.23 Bin Delivered Guyana #1	Inland Creek Coal Sales Co.

(Continued)



VETERANS ADMINISTRATION FACILITIES  
(SCHEDULE NO. 1)

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Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered Guaranteed Analytical Limits	Price Per Ton FOB	Contractor
12.	<u>OHIO</u> Vet. Adm., Breckerville, Ohio (New Hospital) 10600 Breckerville Road Breckerville, Ohio Delivering Carrier - B & O Bin capacity - 60 Tons Coal yard capacity - 3000 Tons Activity does not have its own siding. Truck Delivery.	400 Tons - Aug. 480 " - Sept. 680 " - Oct. 930 " - Nov. 1250 " - Dec. 1350 " - Jan. 1325 " - Feb. 1100 " - Mar. 950 " - Apr. 625 " - May 480 " - June 9,370 " Total	1" x 3/8" Free Swelling Index #3 Max.  Moisture as Received - 10.0% Max. Volatile, Dry (No Limit) Ash, Dry " - 4.0% Min. " - 12.0% Max. Sulphur, Dry " - 2.9% Min. B.T.U., Dry 13,000 Min. A.S.T. 2,150°F	\$7.70 Bin	Midvale Coal Co.
13.	Vet. Adm., Chillicothe, Ohio Delivery carrier B & O RR Hopper cars required Rail Delivery only Activity has its own siding. Outside storage - unlimited capacity. Guaranteed Routings FOB Mins Shipments C & O - B & O Dely. Frt. Rate: \$3.20 Per Ton	300 Tons - July 300 " - Aug. 500 " - Sept. 800 " - Oct. 1000 " - Nov. 1000 " - Dec. 1200 " - Jan. 1200 " - Feb. 1100 " - Mar. 900 " - April 300 " - May 400 " - June 9,200 " Total	1-1/4" x 1/4" Stoker  Oil Treated During Months of November, December, January, February, March and April  Moisture as Received - 10.0% Max. Volatile, Dry (No Limit) Ash, Dry " - 10.0% " Sulphur, Dry " - 1.5% Min. B.T.U., Dry 12,800 Min. A.S.T. 2,100°F	\$5.25 Mine Guyana \$1 \$5.45 for Oil Treatment	Idared Creek Coal Sales Co.

(Continued)

VETERANS ADMINISTRATION FACILITIES  
(SCHEDULE NO. 1)

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Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered Guaranteed Analytical Limits	Price Per Ton FOB
14.	OHIO (Cont'd) Vet. Adm., Cincinnati, Ohio Melish Ave. Team Track RR, Brighton Sta. Cincinnati, Ohio (B & O RR) Bin capacity - 250 Tons Activity does not have its own siding. Bin is fed by outside hopper and conveyor.	660 Tons - July 690 " - Aug. 630 " - Sept. 360 " - Oct. 570 " - Nov. 615 " - Dec. 606 " - Jan. 650 " - Feb. 592 " - Mar. 530 " - Apr. 618 " - May 647 " - June 7,118 " Total	1-1/4" x 0" Not more than 25% passing through a 1/4" round hole screen. Oil treated.  Moisture as Received - 10.0% Max. Volatile, Dry (No Limit) Ash, Dry - 10.0% Sulphur, Dry - 1.5% S.T.U., Dry 13,700 Min. A.S.T. 2,200 <sup>67</sup>	\$8.86 Bin Delivered
15.	Vet. Adm., Dayton, Ohio (National Military Home) 4100 W. Third Street Via Dayton, Ohio B&O RR Activity has its own siding. Storage yard capacity - 6000 tons.	2500 Tons - Oct. 1000 " - Nov. 2000 " - Dec. 2000 " - Jan. 1000 " - Feb. 1000 " - Mar. 1000 " - April 1000 " - May 11,100 " Total	1" x 2 1/2" Free Swelling Index 5 Max.  Moisture as Received - 10.0% Max. Volatile, Dry (No Limit) Ash, Dry - 6.0% Sulphur, Dry 12.0% S.T.U., Dry 13,000 Min. A.S.T. 2,150 <sup>67</sup>	\$7.20 Curt Delivered

DELIVERY REQUIRED BY RAIL IN  
HOPPER BOTTOM CARS

APPROVAL (Continued)

VETERANS ADMINISTRATION FACILITIES  
(SCHEDULE NO. 1)

CR-12777  
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Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered Guaranteed Analytical Limits	Price Per Ton FOB	Contractor
16.	WISCONSIN Vet. Adm., Madison, Wisconsin (CMSTAP R.R. Delivery) Hopper bottom cars required. Activity has its own siding.	186 Tons - July 182 " - Aug. 195 " - Sept. 343 " - Oct. 372 " - Nov. 527 " - Dec. 589 " - Jan. 511 " - Feb. 485 " - Mar. 350 " - April 273 " - May 230 " - June 4,343 " Total	1" x 1/4"  Moisture as Received - 6.0% Max. Volatile, Dry (No Limit) Ash, Dry - 10.0% " Sulphur, Dry - 2.0% " B.T.U., Dry 13,400 Min. A.S.T. 2,400 <sup>00</sup> "	\$12.34  Cars Destina- tion	Great Lakes Coal & Dock
Coal for this station desired delivery from docks at Milwaukee, Wisconsin					
17.	WISCONSIN Vet. Adm., Tomah, Wisconsin Activity does not have its own siding. Bin capacity - 275 Tons Hard standing - 2000 Tons Delivery by truck is required with weekly deliveries approximating 1/4 of month requirements.	320 Tons - July 340 " - Aug. 430 " - Sept. 600 " - Oct. 800 " - Nov. 1000 " - Dec. 1180 " - Jan. 1020 " - Feb. 970 " - Mar. 710 " - Apr. 490 " - May 340 " - June 8,300 " Total	1" x 1/4" Oil Treated  Moisture as Received - 10.0% Max. Volatile, Dry (No Limit) Ash, Dry - 10.0% " Sulphur, Dry - 3.0% " B.T.U., Dry 12,800 Min. A.S.T. 2,300 <sup>00</sup> "	\$10.60	Great Lakes Coal & Dock Company

(Continued)

CH-12777  
Page 13VETERANS ADMINISTRATION FACILITIES  
(SCHEDULE NO. 1)

Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered Guaranteed Analytical Limits	Price Per Ton FOB	Contractor
18.	<p><u>WISCONSIN (Cont'd)</u></p> <p>Vet. Adm., Wood, Wisconsin</p> <p>Bin capacity - 520 Tons</p> <p>Activity does not have its own siding.</p> <p>Delivery by truck is required.</p> <p>Necessary to maintain at all times a reserve supply of not less than 3500 tons of screenings.</p>	<p>275 Tons - July</p> <p>275 " - Aug.</p> <p>350 " - Sept.</p> <p>600 " - Oct.</p> <p>875 " - Nov.</p> <p>1075 " - Dec.</p> <p>1125 " - Jan.</p> <p>1050 " - Feb.</p> <p>1050 " - Mar.</p> <p>750 " - Apr.</p> <p>500 " - May</p> <p>375 " - June</p> <p><u>8300</u> " Total</p>	<p>3/4" x 0 Slack</p> <p>Moisture as Received - 6.0% Max. Volatiles, Dry (No Limit) Ash, Dry - 10.0% " Sulphur, Dry - 1.0% " B.T.U., Dry 13,600 Min. A.S.T. 2,200 " "</p>	<p>\$14.05</p> <p>Bin</p> <p>Delivered</p>	Schoelder Fuel & Supply

FEDERAL PUBLIC BUILDINGS  
(SCHEDULE NO. 2)

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Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered Guaranteed Analytical Limits	Price Per Ton FOB	Contractor
19.	ILLINOIS Chicago, Illinois, CSA, FBS The U.S. Courthouse and Federal Office Building (New) 219 S. Dearborn St. Bin capacity - Two (2) - 90 tons ea. Activity does not have its own siding.	100 Tons - Oct. 750 " - Nov. 1000 " - Dec. 1200 " - Jan. 1200 " - Feb. 1000 " - Mar. 300 " - Apr. 3,350 " Total	3/4" Mesh Washed Screenings  Moisture as Received - 9.3% Max. Volatile, Dry - 40.2% " Ash, Dry - 8.4% " Sulphur, Dry - 2.2% " B.T.U., Dry 13,420 Min. A.S.T. 2,130 <sup>00</sup> "	\$10.49  Bin Delivered	Duan Coal & Oil Co.
20.	U.S. Dept. of the Interior Fish & Wildlife Service Crab Orchard National Wildlife Refuge, Route #2, Cartersville, Ill. Delivery to O'Neill, Ill. Due to road and bridge limitations, 10-ton max. capacity is permitted per truckload. Deliveries can be made Mondays through Saturdays inclusive, and unloaded directly into storage bins.  Washing process to be accomplished prior to crushing and final sizing. Suppliers storage facilities to be adequate to prevent precipitation moisture following processing and prior to delivery.	50 Tons - Oct. 70 " - Nov. 100 " - Dec. 100 " - Jan. 70 " - Feb. 60 " - Mar. 50 " - April 500 " Total	3/4" x 1/4" Mesh washed and oil treated stoker  Moisture as Received - 7.0% Max. Volatile, Dry - 40.0% " Ash, Dry - 10.0% " Sulphur, Dry - 2.75% Min. B.T.U., Dry 12,000 Min. A.S.T. (Unknown)	\$6.30  Bin Delivered	Freeman Coal Mining Corp.

Bin delivery required  
Bin capacity 30 tons (4 bins)  
Truck Delivery only.

(Continued)



FEDERAL PUBLIC BUILDINGS  
(SCHEDULE NO. 2)

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Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered Guaranteed Analytical Limits	Price Per Ton FOB	Contractor
21.	ILLINOIS (Cont'd) Marion, Illinois, Dept. of Justice, United States Penitentiary Activity does not have own siding. Bin capacity - 450 tons. Bin delivery required by truck.	125 Tons - Aug. 150 " - Sept. 250 " - Oct. 350 " - Nov. 480 " - Dec. 500 " - Jan. 525 " - Feb. 425 " - Mar. 325 " - April 250 " - May 125 " - June 3,330 " Total	3/4" x 28 Mesh, Small Stoker Washed Free Swelling Index No. 6 Max.  Moisture as Received - 9.0% Max. Volatile, Dry - 40.0% " Ash, Dry - 10.6% " Sulphur, Dry - 2.9% " B.T.U., Dry 11,760 Min. A.S.T. 2,150°F	\$5.70  Bin Delivered	Fresman Coal Mining Corp.
22.	INDIANA Hammond, Indiana, GSA, Defense Materials Service, Hammond Depot, for use at Tank Farm.  Silo capacity - 50 tons Ground storage capacity - 50 tons Activity does not have its own siding. Bin delivery required by truck.	50 Tons - Sept. 100 " - Oct. 100 " - Nov. 100 " - Dec. 100 " - Jan. 100 " - Feb. 50 " - Mar. 50 " - April 50 " - May 700 " Total	1-1/2" x 1/4" Washed nut Stoker, with mixture as follows:  1-1/2 - 3/4 - 44% 3/4 - 3/8 - 36% 3/8 - 1/4 - 20%  Moisture as Received - 11.0% Max. Volatile, Dry - 44.0% " Ash, Dry - 10.0% " Sulphur, Dry - 3.0% " B.T.U., Dry 13,252 Min. A.S.T. 2,220°F	\$10.40  Bin Delivered	Heiser Coal & Oil Co.

(Continued)



FEDERAL PUBLIC BUILDINGS  
(SCHEDULE NO. 2)

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Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered Guaranteed Analytical Limits	Price Per Ton FOB	Contractor
23.	INDIANA (Cont'd) Jeffersonville, Indiana, GSA, PBS Jeffersonville Depot Delivery carrier - NYC Activity has its own siding. Bin capacity 800 Tons. Bin delivery required by truck.	550 Tons - Oct. 600 " - Nov. 1000 " - Dec. 1000 " - Jan. 1000 " - Feb. 970 " - Mar. 400 " - Apr. <u>5,530</u> " Total	1-1/4" x 28" mesh Washed screenings. Oil treated  Moisture as received - 10.3% Max. Volatile, Dry - 45.3% " Ash, Dry - 8.8% " Sulphur, Dry - 3.9% " B.T.U., Dry 13,100 Min. A.S.T. 2,100 <sup>op</sup> "	\$7.69 Bin Delivered	Arme Fuel Co. Charles Buddette Coal Co.
24.	Terre Haute, Indiana, Dept. of Justice, United States Penitentiary Yard pile capacity - 1000 Tons Bin capacity - 300 Tons. Bin delivery required. Truck delivery only.	1480 Tons - July 480 " - Aug. 480 " - Sept. 480 " - Oct. 1080 " - Nov. 1080 " - Dec. 1080 " - Jan. 1080 " - Feb. 900 " - Mar. 860 " - Apr. <u>9,000</u> " Total	1-1/4" x 28" mesh. Not to exceed 20% Fines  Moisture as Received - 20.0% Max. Volatile, Dry - 44.0% " Ash, Dry - 10.0% " Sulphur, Dry - 2.0% " B.T.U., Dry 13,000 Min. A.S.T. 2,300 <sup>op</sup> "	\$5.70 Bin Delivered	Peabody Coal Co.

(Continued)

FEDERAL PUBLIC BUILDINGS  
(SCHEDULE NO. 2)

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Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered	Guaranteed Analytical Limits	Price Per Ton FOB	Contractor
25.	INDIANA (Cont'd) Terre Haute, GSA DMS Depot Bin Capacity - 30 Tons Truck Delivery Only	30 Tons - Oct. 60 " - Nov. 70 " - Dec. 80 " - Jan. 60 " - Feb. 50 " - Mar. 350 " Total	1-1/4 x 1/4 Washed, Stoker	Analytical Limits: Moisture as Received - 9.5% Max. Volatile, Dry - 42.1% " Ash, Dry - 8.4% " Sulphur, Dry - 3.1% " B.T.U., Dry 13,000 Min. A.S.T. 2,150°F "	\$7.50 Bin Delivered	Beil & Zoller
26.	KENTUCKY Lexington Clinical Research Center 400 Ton bin capacity. Hopper bottom car required. Activity has its own siding. Delivering carrier Louisville & Nashville R.R. Delivery Point, Narzo, Fayette City.	395 Tons - Aug. 354 " - Sept. 826 " - Oct. 1062 " - Nov. 1121 " - Dec. 1180 " - Jan. 1121 " - Feb. 1062 " - Mar. 708 " - Apr. 472 " - May 293 " - June 8,496 " Total	3/4" slack	Moisture as Received - 8.0% Max. Volatile, Dry - 36.6% " Ash, Dry - 10.0% " Sulphur, Dry - 2.0% " B.T.U., Dry 13,500 Min. A.S.T. 2,500°F "	\$8.26 Cure Destination	Scotia Coal Co.

(Continued)

FEDERAL PUBLIC BUILDINGS  
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Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons.	Size Offered	Guaranteed Analytical Limits	Price Per Ton FOB	Contractor
27.	<b>KENTUCKY (Cont'd)</b> Louisville, Kentucky, GSA, FBS, 830 West Broadway Bin capacity - 30 Tons. Activity does not have its own siding.	30 Tons - Oct. 40 " - Nov. 60 " - Dec. 80 " - Jan. 80 " - Feb. 80 " - Mar. <hr/> 350 Total	1-1/2" x 28 Mesh Oil Treated  Moisture - 9.35 Max. Volatile, Dry - 44.1% Ash, Dry - 9.3% Sulphur, Dry - 3.6% B.T.U., Dry 13,500 Min. A.S.T. 2,080°P	\$7.69 Bin Delivered	Charles Buddels Coal Co.	
28.	Louisville, Kentucky, GSA, FBS, 1405 West Broadway Bin capacity - 150 Tons. Activity does not have its own siding.	50 Tons - Oct. 50 " - Nov. 50 " - Dec. 100 " - Jan. 100 " - Feb. 50 " - Mar. <hr/> 400 Total	1-1/2" x 28 Mesh stocker Oil Treated.  Moisture as Received - 7.5% Max. Volatile, Dry - 42.8% Ash, Dry - 9.3% Sulphur, Dry - 3.3% B.T.U., Dry 13,500 Min. A.S.T. 2,080°P	\$7.69 Bin Delivered	Acme Fuel Charles Buddels Coal Co.	

(Continued)

FEDERAL PUBLIC BUILDINGS  
(SCHEDULE NO. 2)

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Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered Guaranteed Analytical Limits	Price Per Ton FOB	Contractor
29.	<p><u>MICHIGAN</u></p> <p>Battle Creek, Michigan, GSA, FBS Federal Center</p> <p>Delivering carrier - NYC (MCRS)</p> <p>Goodola cars required.</p> <p>Bin capacity - 400 Tons, Bldg. #3</p> <p>Ground storage - 4,000 Tons.</p> <p>W. Jackson Street Yard.</p> <p>Activity has own siding.</p>	<p>200 Tons - Sept.</p> <p>600 " - Oct.</p> <p>850 " - Nov.</p> <p>950 " - Dec.</p> <p>950 " - Jan.</p> <p>950 " - Feb.</p> <p>800 " - Mar.</p> <p>400 " - Apr.</p> <p>300 " - May</p> <p>200 " - June</p> <p><u>6500</u> " - Total</p>	<p>1-1/4" x 1/4"</p> <p>Washed - Oil Treated</p> <p>Moisture as Received - 4.4% Max.</p> <p>Volatile, Dry - 36.7% "</p> <p>Ash, Dry - 6.4% "</p> <p>Sulphur, Dry - 1.3% "</p> <p>B.T.U., Dry. 14,320 Min.</p> <p>A.S.T. 3,400° F "</p>	<p>\$10.92</p> <p>Cus</p> <p>Destination</p>	<p>Seattle Coal Co.</p>
30.	<p>Watermeet, Michigan, U.S. Forest Service</p> <p>Bin capacity - 60 tons.</p> <p>Bin delivery required by truck</p> <p>Activity does not have its own siding.</p>	<p>50 Tons - Nov.</p> <p>50 " - Feb.</p> <p>50 " - April</p> <p><u>150</u> " - Total</p>	<p>1" x 3/8"</p> <p>Washed and treated stocker.</p> <p>Moisture as Received - 8.0% Max.</p> <p>Volatile, Dry - 42.0% "</p> <p>Ash, Dry - 8.5% "</p> <p>Sulphur, Dry (Unknown)</p> <p>B.T.U., Dry 13,300 Min.</p> <p>A.S.T. 2,130° F "</p>	<p>\$13.65</p> <p>Bin</p> <p>Delivered</p>	<p>C. Rolin Coal Co.</p>

(Continued)

FEDERAL PUBLIC BUILDINGS  
(SCHEDULE NO. 3)

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Item No.	Destination	Estimated Quantity Tentative Shipping Schedule Net Tons	Size Offered Guaranteed Analytical Limits	Price Per Ton FOB	Contractor
31.	<u>OHIO</u> Cleveland, Ohio, W.A. & S.A. Lewis Research Center.  Coal to be deep mined only, washed or dry cleaned and, free burning for use in Pitco spreader type Stokers.	500 Tons - Oct. 1000 " - Nov. 1000 " - Dec. 1000 " - Jan. 1000 " - Feb. 1000 " - Mar. 1000 " - April 500 " - May <u>7,000</u> " Total	1-1/4" x 3/8" Stoker No slack  Moisture as Received - 5.3% Max. Volatile, Dry - 43.3% " Ash, Dry - 10.0% " Sulphur, Dry - 3.0% " B.T.U., Dry 13,000 Min. A.S.T. 2,100°F	\$8.10 Bin Delivered	Midvale Coal Co.
	Coal supplier shall remove the flyash from the storage hopper at the heating plant. Loading of flyash will be done by the Government. It is the intent of this Laboratory that the 200 ton hopper in the steam generating plant be kept filled to its capacity at all times, and deliveries will be accepted at all times. However, not more than 20% of the deliveries should be made between the hours of 5 P.M. and 8 A.M. the next day. Yard storage - 7000 tons.				
32.	Columbus, Ohio, PBS, U.S. Post Office and Courthouse, 85 Marconi Bld., (new)  Activity does not have its own siding.  Bin capacity - 100 tons.	100 Tons - Oct. 200 " - Nov. 200 " - Dec. 200 " - Jan. 200 " - Feb. 100 " - Mar. 100 " - April 100 " - May <u>1,200</u> " Total	1-1/4" x 1/4" Stoker  Moisture as Received - 2.9% Max. Volatile, Dry - 37.0% " Ash, Dry - 5.3% " Sulphur, Dry 14.475 Min. B.T.U., Dry 2,960°F A.S.T.	\$9.47 Cars Destination	Scotts Coal Co.



## LIST OF CONTRACTORS

## ALL ADVERTISED

Contracts awarded as a result of advertising pursuant to Section 303, Public Law, 152, 81st Congress

<u>Contract No.</u>	<u>Name and Address</u>	<u>Telephone No.</u>
*GS-055-4843	Atlas Coal & Blacktop, Inc. 1105 Sarasota Street Newport, Kentucky	(606) 431-1672
	Terms: Net Name of Mine: Guyan #4 Mine Location & Shipping Point: Stows, Logan County, West Va.	
*GS-055-4939	Bell & Zoller Coal Company 208 South LaSalle Street Chicago, Illinois 60604	(312) CE6-4222
	Terms: Net Name of Mine: Zeigler #4 (Item #3) Mine Location: Johnston City, Williamson County, Illinois Mine Shipping Point: Zeigler Mine, Illinois	
	Name of Mine: Mount Pleasant (Item #25) Mine Location: Terre Haute, Vigo, Indiana Mine Shipping Point: Terre Haute, Indiana	
*GS-055-4845 (Item 16)	Great Lakes Coal & Dock Co. 611 E. Wisconsin Avenue Milwaukee, Wisconsin 53202	(414) 272-4285
	Terms: Net Name of Mine: Guyan #5 Mine Location & Shipping Point: Kelly, Logan County, W. Va.	
*GS-055-4944 (Item 17)	Great Lakes Coal & Dock Co. 611 E. Wisconsin Avenue Milwaukee, Wisconsin 53202	(414) 272-4285
	Terms: Net Name of Mine: Orient #4 Mine Location & Shipping Point: Johnston City, Williamson, Illinois	

(Continued)



## LIST OF CONTRACTORS

## ALL ADVERTISED

Contracts awarded as a result of advertising pursuant to Section 303, Public Law 152, 81st Congress

Contract No.	Name and Address	Telephone No.
*GS-055-4943	Dunn Coal & Oil Company 3100 So. Federal Street Chicago, Illinois 60609	(312) OAA-1551
	Terms: Net Name of Mine: Orient No. 4 Mine Location: Johnston City, Williamson County, Illinois Mine Shipping Point: Orient No. 4, Illinois	
*GS-055-4938	Enos Coal Sales Div. Pickands Mather & Co. (Agent for Enos Coal Corp.) 300 Fidelity Bldg. 111 Monument Circle Indianapolis, Indiana 46204	(317) 636-6591
	Terms: Net Name of Mine: Blackfoot Five Mine Location & Shipping Point: Winslow, Pike County, Indiana	
*GS-055-4946	Freeman Coal Mining Corporation 300 W. Washington Street Chicago, Illinois 60606	(312) AN3-2800
	Terms: Net Name of Mine: Orient No. 4 Mine Location: Johnston City, Williamson County, Illinois Mine Shipping Point: Orient No. 4, Illinois	
*GS-055-4937	Frontenac Coal Corporation 105 South Meridian Street Indianapolis, Indiana 46223	(317) 632-2441
	Terms: Net Name of Mine: Harmatten Mine Location: Danville, Vermilion County, Illinois Mine Shipping Point: Hillery, Illinois	

(Continued)

## LIST OF CONTRACTORS

## ALL ADVERTISED

Contracts awarded as a result of advertising pursuant to Section 303, Public Law 152, 81st Congress

<u>Contract No.</u>	<u>Name and Address</u>	<u>Telephone No.</u>
*GS-055-4940	Scotia Coal Company P.O. Box 10080 Knoxville, Tennessee 37919	(615) 588-8511
	Terms: Net Name of Mine: Royal Scot Mine Location & Shipping Point: Scot, Letcher County, Kentucky	
*GS-055-4947	Hefter Coal & Oil Company 3018 East 95th Street Chicago, Illinois 60617	(312) RE4-6767
	Terms: Net Name of Mine: Zeigler #4 Mine Location: Johnston City, Williamson County, Illinois Mine Shipping Point: Zeigler Mine, Illinois	
*GS-055-4846	Inland Creek Coal Sales Company 1501 Euclid Avenue Cleveland, Ohio	(216) 241-3215
	Terms: Net	
<u>For Items 8-9-11-13</u>		
	Name of Mine: Guyan #1 Mine Location & Shipping Point: Amherstdale, Logan, W. Va.	
<u>For Item 14</u>		
	Name of Mine: Guyan #4 Mine Location: Stowe, Logan County, West Va. Mine Shipping Point: Stowe, West Va.	
*GS-055-4844	Schneider Fuel & Supply Co. 3438 West Forest Home Avenue Milwaukee, Wisconsin 53246	(414) 671-5100
	Terms: Net Mine Location & Shipping Point: Bishop, McDowell, West Va.	

(Continued)

## LIST OF CONTRACTORS

## ALL ADVERTISED

Contracts awarded as a result of advertising pursuant to Section 303, Public Law, 152, 81st Congress

Contract No.	Name and Address	Telephone No.
*CS-055-4942	Midvale Coal Company, Inc. Island Creek Coal Sales Company, Agents 1501 Euclid Avenue Cleveland, Ohio 44115	(216) 241-3215
	Terms: Net Name of Mine: Midvale Mine Location & Shipping Point: Midvale, Tuscarawas County, Ohio	
*CS-055-4943	Peabody Coal Company 301 North Memorial Drive St. Louis, Missouri 63102	(314) Geneva 6-3400
	Terms: Net	
	<u>For Item 10</u>	
	Name of Mine: Sunnyhill #9 Mine Location & Shipping Point: New Lexington, Perry County, Ohio	
	<u>For Item 24</u>	
*CS-055-4810	Name of Mine: Chieftain #20 Mine Location: Riley, Vigo County, Indiana Mine Shipping Point: Keller, Indiana	
*CS-055-4941	The C. Reis Coal Company Sheboygan, Wisconsin 53081	(414) 437-4411
	Terms: Net	
	Name of Mine: Hampton No. 3 Mine Location & Shipping Point: Hampton Mines, Boone County, West Va.	

(Continued)

## LIST OF CONTRACTORS

## ALL ADVERTISED

Contracts awarded as a result of advertising pursuant to Section 303, Public Law, 151, 81st Congress

Contract No.	Name and Address	Telephone No.
*GS-055-4958	Acme Fuel Charles Buddake Coal Co. 907 Logan Street Louisville, Kentucky 40203	(502) 584-3263
	Name of Mine: Flax Mine Location & Shipping Point: Flax, Kentucky	
*GS-055-5061	Charles Buddake Coal Company 907 Logan Street Louisville, Kentucky 40203	(502) 584-3263
	Name of Mine: Flax Mine Location & Shipping Point: Flax, Kentucky	

- \* Contractor is not a small business concern.  
 \* Contractor is a small business concern.

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GOVERNMENT  
EXHIBIT  
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## GENERAL DYNAMICS CORPORATION

## ASSETS

LINE	CLASSIFICATION	CODE	AMOUNT
1	CURRENT ASSETS		
2	CASH		1,255,164.71
3	U.S. AND CANADIAN GOVERNMENT SECURITIES		1,000,000.00
4	ACCOUNTS AND NOTES RECEIVABLE -		
5	U.S. AND CANADIAN GOVERNMENTS		-
6			
7	OTHER TRADE RECEIVABLES		57,257,666.00
8	LESS - RESERVE FOR DOUTIFUL ACCT.		(17,721.12)
9	OTHER TRADE RECEIVABLES - NET		57,240,000.00
10			
11	INTERCOMPANY RECEIVABLES - CURRENT		(1,191,725.00)
12			
13	UNRECOVERED EXPENDITURES AND ESTIMATED		
14	PROFIT PRINCIPALLY ON AIRCRAFT AND SHIP		
15	CONTRACTS IN PROCESS		-
16			
17	INVENTORIES -		
18	FINISHED GOODS		11,027,715.71
19	WORK IN PROCESS		-
20	MATERIALS, PARTS AND SUPPLIES		-
21			
22	LESS - ADVANCE AND PROGRESS PAYMENTS		-
23	INVENTORIES - NET		11,027,715.71
24			
25	ADVANCES TO VENDORS AND SUBCONTRACTORS		-
26	PREPAID EXPENSES		1,120,141.00
27			
28	TOTAL		10,742,715.71
29			
30	INVESTMENTS AND OTHER ASSETS		
31	INVESTMENTS AND ADVANCES -		
32	CONCENTRATED INVESTMENTS		-
33	UNRECOVERED INVESTMENTS		-
34	OTHER		55,577,155.00
35	NONCURRENT RECEIVABLES AND OTHER ASSETS		
36	NOTES AND OTHER RECEIVABLES		2,150,000.00
37	LESS AIRCRAFT LESS AMORTIZATION		-
38	OTHER ASSETS		1,877,111.00
39			
40			
41			
42	TOTAL		7,527,111.00
43			
44			
45			
46	FIXED ASSETS		
47	LAND AND IMPROVEMENTS		72,000.00
48	BUILDINGS AND IMPROVEMENTS		-
49	MACHINERY AND EQUIPMENT		17,254,111.00
50	CONSTRUCTION IN PROCESS		1,001,741.00
51			
52	LESS - RES. FOR DEPR. AND AMORTIZATION		(1,001,741.00)
53	FIXED ASSETS - NET		18,254,111.00
54			
55	TOTAL		28,524,111.00

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• GENERAL DYNAMICS CORPORATION

**LIABILITIES,  
CAPITAL & SURPLUS**

GOVERNMENT  
EXHIBIT  
Sup. 129.

LINE	CLASSIFICATION	CYCLE	PERIOD
1	CURRENT LIABILITIES		
2	NOTES PAYABLE		-
3	CURRENT PORTION OF LONG-TERM DEBT		-
4	ACCOUNTS PAYABLE		11/2/82 11/2/82
5	ACCUMULATED SALARIES AND WAGES		11/2/82 11/2/82
6	U.S. AND CANADIAN INCOME TAXES		11/2/82 11/2/82
7	OTHER ACCRUED TAXES		11/2/82 11/2/82
8	CONTRACT DEPOSITS AND ADVANCES IN		-
9	EXCESS OF RELATED COSTS		-
10	INTERVIVOS PAYABLE		-
11	INTERCOMPANY PAYABLES - CURRENT		11/2/82 11/2/82
12	LONG-TERM DEBT - CURRENT PORTION		11/2/82 11/2/82
13	TOTAL		11/2/82 11/2/82
14	LONG-TERM DEBT - LONG-TERM INSTALLMENTS		-
15	NOTES PAYABLE		-
16	MORTGAGES PAYABLE		-
17	INTERCOMPANY PAYABLES		-
18	TOTAL		-
19	MINORITY INTERESTS		-
20	CAPITAL STOCK		-
21	SURPLUS		-
22	TOTAL		-
23	INTERVIVOS ACCOUNT		-
24	INTERVIVOS CASH ACCOUNT		-
25	CAPITAL STOCK AND SURPLUS		-
26	CAPITAL STOCK -		-
27	PREFERRED		-
28	COMMON		11/2/82 11/2/82
29	CAPITAL SURPLUS		-
30	EARLY SURPLUS -		-
31	BALANCE AT BEGINNING OF YEAR		11/2/82 11/2/82
32	PROFIT (LOSS) FOR THE PERIOD		11/2/82 11/2/82
33	LESS-DIVIDENDS		-
34	BALANCE AT END OF PERIOD		11/2/82 11/2/82
35	TOTAL		11/2/82 11/2/82
36	TOTAL		11/2/82 11/2/82

GENERAL DYNAMICS CORPORATION

PROFIT AND LOSS

GOVERNMENT  
EXHIBIT  
Reg. 1-C

General Dynamics Corp.  
Consolidated  
12-31-59

LINE	CLASSIFICATION	DATE	AMOUNT
1	SALES, LESS RETURNS		24,015,763.05
2	DISCOUNTS		-
3	ALLOWANCES		72,085.01
4	NET SALES		24,243,679.34
5			
6	COST OF SALES		
7	MATERIAL, LABOR AND OVERHEAD		28,430,089.73
8	UNDEVELOPED AMORTIZED OVERHEAD		-
9	SELLING AND ADVERTISING EXPENSE		553,156.26
10	GENERAL AND ADMINISTRATIVE EXPENSE		556,122.97
11	RESEARCH AND DEVELOPMENT EXPENSE		-
12	COMP. OFFICE & GEN. ATOMIC DIV. EXPENSE		-
13	TOTAL		29,539,368.96
14			
15	OPERATING PROFIT (LOSS)		2,904,370.38
16			
17	OTHER INCOME (DEDUCTIONS)		
18	DIVIDENDS -		
19	CONSOLIDATED SUBSIDIARIES		-
20	UNCONSOLIDATED SUBSIDIARIES		-
21	OTHER		-
22	INCENTIVE COMPENSATION CREDIT*		-
23	CYCLINDER DAMAGE		-
24	INTEREST INCOME		55,134.51
25	GAIN ON SALE -		-
26	INDEBITED		-
27	FIELD AMOUNTS		3,837.93
28	ROYALTIES		-
29			
30			
31	INTEREST EXPENSE		(37,439.00)
32	INCENTIVE COMPENSATION PROVISION		-
33	SECURITY INTERESTS		-
34	OTHER NET		14,727.83
35	IN-REPOSE PROFIT DEFERRED PROVISION		(265,536.80)
36	OTHER INCOME (DEDUCTIONS) - NET		(230,075.53)
37			
38	PROFIT (LOSS) BEFORE TAXES		2,674,296.85
39			
40	PROVISION FOR INCOME TAXES		500,000.00
41			
42	NET PROFIT (LOSS)		2,174,296.85
43	BREAKDOWN OF NET SALES		
44	RESTRICTED		-
45	UNRESTRICTED		24,243,679.34
46	TOTAL (PER LINE 4)		24,243,679.34
47	INTERST. AND INTERCO. TRANSACTIONS		
48	INTERDIVISION SALES		-
49	INTERCOMPANY -		
50	SALES		2,638,612.76
51	INTEREST INCOME		-
52	INTEREST EXPENSE		-
53	DEPRECIATION, AMORTIZATION AND DEPLETION		-
54	PROPERTY, PLANT AND EQUIP.		1,763,185.02
55	USED AIRCRAFT		-

AS IS SHOWN ON

\*For Corporate Income Tax Only

GOVERNMENT  
EXHIBIT  
Hus. Dep.  
2-A

## GENERAL DYNAMICS CORPORATION

REVISED - MARCH 30, 1961  
ASSETS

LINE	CLASSIFICATION	DEBT	EQUITY
1	CURRENT ASSETS		
2	CASH		\$ 378,023.61
3	U.S. AND CANADIAN GOVERNMENT SECURITIES		1,000,467.95
4	ACCOUNTS AND NOTES RECEIVABLE -		
5	U.S. AND CANADIAN GOVERNMENTS		-
6			
7	OTHER TRADE RECEIVABLES		2,781,855.80
8	LESS - RESERVE FOR DOUTFUL ACCTS		27,716.25
9	OTHER TRADE RECEIVABLES - NET		2,754,139.55
10	SIXTY TERM SECURITIES		223,833.33
11	INTERCOMPANY RECEIVABLES - CURRENT		1,227,441.61
12			
13	UNREBURSED EXPENDITURES AND ESTIMATED		
14	PROFIT PRINCIPALLY ON AIRCRAFT AND SHIP		
15	CONTRACTS IN PROCESS		-
16			
17	INVENTORIES -		
18	FINISHED GOODS		61,251.54
19	WORK IN PROCESS		-
20	MATERIALS, PARTS AND SUPPLIES		-
21			
22	LESS - ADVANCE AND PROGRESS PAYMENTS		-
23	INVENTORIES - NET		61,251.54
24			
25	ADVANCES TO VENDORS AND SUBCONTRACTORS		-
26	PREPAID EXPENSES		\$ 1,857.68
27			
28	TOTAL	11,436,725.96	
29			
30	INVESTMENTS AND OTHER ASSETS		
31	INVESTMENTS AND ADVANCES -		
32	CONSOLIDATED SUBSIDIARIES		-
33	UNCONSOLIDATED SUBSIDIARIES		-
34	OTHER		960,937.50
35	NONCURRENT RECEIVABLES AND OTHER ASSETS		9,550.00
36	NOTES AND OTHER RECEIVABLES -		-
37	USED AIRCRAFT LESS AMORTIZATION		-
38	OTHER ASSETS		35,002.13
39			
40			
41			
42	TOTAL	379,409.63	
43			
44			
45			
46	FIXED ASSETS		
47	LAND AND IMPROVEMENTS		3,556,111.50
48	BUILDINGS AND IMPROVEMENTS		-
49	MACHINERY AND EQUIPMENT	22,057,765.83	
50	CONSTRUCTION IN PROCESS	3,068,650.00	
51			
52	LESS - RES. FOR DEPR. AND AMORTIZATION	12,177,000.00	
53	FIXED ASSETS - NET	13,007,226.33	
54			
55	TOTAL	28,443,952.29	

44 CREWED 3740

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GOVERNMENT  
EXHIBIT  
Aug. 2-8

GENERAL DYNAMICS CORPORATION			
REVISED - MARCH 30, 1961			
LIABILITIES, CAPITAL & SURPLUS			
LINE	CLASSIFICATION	CODE	AMOUNT
1	CURRENT LIABILITIES		
2	NOTES PAYABLE		-
3	CURRENT PORTION OF LONG-TERM DEBT		-
4	ACCOUNTS PAYABLE		822 609 44
5	ACCRUED SALARIES AND WAGES		672 305 47
6	U.S. AND CANADIAN INCOME TAXES		971 470 43
7	OTHER ACCRUED TAXES		118 375 43
8	CONTRACT DEPOSITS AND ADVANCES IN		-
9	EXCESS OF RELATED COSTS		-
10	DIVIDENDS PAYABLE		-
11	INTERCOMPANY PAYABLES - CURRENT		212 900 19
12	INTEREST PAYABLE - CURRENT		105 000 00
13	INTEREST PAYABLE - LONG-TERM		259 150 10
14	TOTAL	5	1,022,529 47
15			
16	LONG-TERM DEBT LESS CURRENT INSTALLMENTS		
17			
18	NOTES PAYABLE		-
19			
20	MORTGAGES PAYABLE		-
21			
22	INTERCOMPANY PAYABLES		-
23			
24	TOTAL		-
25			
26	MINORITY INTERESTS		
27	CAPITAL STOCK		
28	SURPLUS		-
29			
30	TOTAL		-
31			
32	INTERDIVISION ACCOUNT		-
33	INTERDIVISION CASH ACCOUNT		-
34			
35			
36	CAPITAL STOCK AND SURPLUS		
37	CAPITAL STOCK -		
38	PREFERRED		-
39	COMMON		63 905 00
40			
41	CAPITAL SURPLUS		-
42			
43	EARNED SURPLUS -		
44	BALANCE AT BEGINNING OF YEAR	16	175 153 57
45	PROFIT (LOSS) FOR THE PERIOD	8	259 150 10
46			
47			
48	LESS-DIVIDENDS		-
49			
50			
51	BALANCE AT END OF PERIOD	25	259 150 10
52			
53	TOTAL	25	259 150 10
54			
55	TOTAL	25	259 150 10

P. 10 PREPARED 5-60





1747

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TREASURY OF THE UNITED STATES

## GENERAL DYNAMICS CORPORATION

 FISCAL YEAR  
 1964  
 12 MONTH PERIOD  
 ENDED  
 Dec. 31, 1964  
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 GOVERNMENT  
 EXHIBIT  
 Reg. Dep.  
 3-A

## ASSETS

LINE	CLASSIFICATION	CODE	AMOUNT
1	CURRENT ASSETS		
2	CASH		5 017 942
3	GOVERNMENT & OTHER MARKETABLE SECURITIES		3 015 576
4	ACCOUNTS AND NOTES RECEIVABLE-		
5	U.S. AND CANADIAN GOVERNMENTS		-
6			
7	NOTES RECEIVABLE		-
8	OTHER TRADE RECEIVABLES	2	860 136
9	LESS-RESERVE FOR DOUTFUL ACCT.		17 718
10	NOTES AND OTHER TRADE REC-NET	2	842 418
11			
12	INTERCOMPANY RECEIVABLES-CURRENT		168 910
13			
14	UNRECOVERED EXPENDITURES AND ESTIMATED PROFITS ON CONTRACTS IN PROCESS		-
15			
16	INVENTORY-		
17	FINISHED GOODS		53 508
18	WORK IN PROCESS		-
19	MATERIALS, PARTS AND SUPPLIES		-
20	TOTAL		53 508
21	LESS-ADVANCE AND PROGRESS PAYMENTS		-
22	INVENTORY-NET		53 508
23			
24	ADVANCES TO VENDORS AND SUBCONTRACTORS		-
25	PREPAID EXPENSES		2 651
26			
27			
28	TOTAL	11	150 222
29	INVESTMENTS AND OTHER ASSETS		
30	INVESTMENTS AND ADVANCES-		
31	CONSOLIDATED SUBSIDIARIES		-
32	UNCONSOLIDATED SUBSIDIARIES		-
33	OTHER		168 535
34	NONCURRENT RECEIVABLES AND OTHER ASSETS-		
35	NOTES RECEIVABLE		-
36	OTHER RECEIVABLES		3 150
37	USED AIRCRAFT LESS AMORTIZATION		-
38	OTHER ASSETS		16 672
39			
40			
41	TOTAL		182 655
42	PROPERTY, PLANT AND EQUIPMENT		
43	LAND		167 724
44	LAND IMPROVEMENTS	2	530 137
45	TOTAL LAND AND IMPROVEMENTS	2	713 863
46	BUILDINGS AND IMPROVEMENTS		-
47	MACHINERY AND EQUIPMENT	27	116 610
48	CONSTRUCTION IN PROCESS		-
49	TOTAL	30	260 503
50	LESS-DEP. FOR DEPR. AND AMORTIZATION	14	290 598
51			
52	FIXED ASSETS-NET	15	249 905
53			
54	TOTAL	27	453 783

P-2 (REVISED 6-67)

 August 6-8  
 Ex 3-A  
 9/10/68

GOVERNMENT  
EXHIBIT  
RUS. Dep.  
3-B

## GENERAL DYNAMICS CORPORATION

LIABILITIES,  
CAPITAL & SURPLUS

Form 487-1  
12-10-60 Corp.  
RUS. Dep. 12-10-60  
DPO. 11, 1963  
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LINE	ELABORATION	CASH	AMOUNT
1	CURRENT LIABILITIES		
2	NOTES PAYABLE TO BANKS		-
3	CURRENT PORTION OF LONG-TERM DEBT		-
4	OTHER NOTES PAYABLE		-
5	ACCOUNTS PAYABLE		107
6	ACCRUED SALARIES AND WAGES		915
7	U.S. AND CANADIAN INCOME TAXES		613
8	OTHER ACCRUED TAXES		22
9	CONTRACT DEFERMENTS AND ADVANCES IN EXPENSE OF RELATED COSTS		-
10	DIVIDENDS PAYABLE		-
11	INTERCOMPANY PAYABLES - CURRENT		159
12			
13			
14	TOTAL		1,104
15	LONG-TERM DEBT LESS CURRENT INSTALLMENTS		
16			
17	NOTES PAYABLE		-
18	MORTGAGE PAYABLE		-
19			
20	INTERCOMPANY PAYABLES		-
21			
22			
23	TOTAL		-
24	MINORITY INTERESTS		
25	CAPITAL STOCK		-
26			
27	SURPLUS		-
28			
29	TOTAL		-
30	INTERDIVISION ACCOUNTS		
31	CURRENT ACCOUNT		-
32	CASH ACCOUNT		-
33			
34	TOTAL		-
35	CAPITAL STOCK AND SURPLUS		
36	CAPITAL STOCK OF GENERAL DYNAMICS-		
37	PREFERRED		-
38	COMMON		-
39	CAPITAL STOCK OF CONSOLIDATED BUS.-		
40	PREFERRED		-
41	COMMON		615
42			
43	CAPITAL SURPLUS		-
44			
45	EARNED SURPLUS--		
46	BALANCE AT BEGINNING OF YEAR	19	25,709
47			
48	PROFIT (LOSS) FOR THE PERIOD	2	68,555
49			
50	LESS-DIVIDENDS		-
51	BALANCE AT END OF PERIOD	21	94,264
52	TOTAL	24	94,264
53			
54	TOTAL	27	151,761

FD-302 (REVISED 5-61)

Aug 28 dep  
Ex 3-B  
9/10/63

THESE FIGURES  
ARE IN  
THOUSANDS

## GENERAL DYNAMICS CORPORATION

## PROFIT AND LOSS

PROFIT AND LOSS  
Kling Corp.  
Consolidated  
1/1/61 - 12/31/61  
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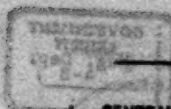
GOVERNMENT  
EXHIBIT  
NO. 3-6

LINE	CLASSIFICATION	AMOUNT
1	SALES, LESS RETURNS	29,054,119
2	DISCOUNTS	-
3	ALLOWANCES	77,000
4	NET SALES	29,077,119
5	COST OF SALES	-
6	MATERIAL, LABOR AND OVERHEAD	25,375,528
7	INVENTORIES	-
8	DEPRECIATION AND AMORTIZATION EXPENSE	1,98,723
9	RESEARCH AND ADMINISTRATIVE EXPENSE	678,235
10	INDEMNITY AND INDEMNITY EXPENSE	-
11	OTHER INCOME & CHARGE ACCOUNT EXPENSE	-
12		-
13	TOTAL	26,552,301
14		-
15	OPERATING PROFIT (LOSS)	3,524,790
16	OTHER INCOME (DEDUCTIONS)	-
17	INVENTORIES	-
18	CONSOLIDATED SUBSIDIARIES	-
19	UNCONSOLIDATED SUBSIDIARIES	-
20	OTHER	350
21	INCENTIVE COMMISSION CREDIT	-
22	CYBERNET DAMAGE	-
23	INTEREST INCOME	72,500
24	GAIN ON SALE	-
25	SECURITIES	-
26	FIXED ASSETS	1,500
27	ROYALTIES	-
28		-
29		-
30	INTEREST EXPENSE	(95)
31	INCENTIVE COMMISSION PROVISION	(152,650)
32	MINORITY INTERESTS	-
33		-
34	OTHER INCOME	(152)
35	OTHER INCOME (DEDUCTIONS) - NET	(10)
36	PROFIT (LOSS) BEFORE TAXES	3,243,500
37		-
38	PROVISION FOR INCOME TAXES	625,000
39		-
40	NET PROFIT (LOSS)	2,618,500
41	BREAKDOWN OF NET SALES	-
42	RESTRICTED	-
43	UNRESTRICTED	29,077,119
44	TOTAL (BY LINE 4)	29,077,119
45	INTEREST AND INTERCO. TRANSACTIONS	-
46	INTERDIVISION SALES	-
47	INTERCOMPANY	-
48	SALES	1,255,000
49	INTEREST INCOME (EXPENSE)	-
50		-
51	DEPRECIATION, AMORTIZATION AND DEPLETION	-
52	PROPERTY, PLANT AND EQUIP.	2,825,931
53	DEPLETION IN EXCESS OF COST BASIS	2,019,361
54	USED AIRCRAFT	-
55		-

P-10 (REVISED 3-60)

For Corporate Use Only

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Ex 3-e, to  
9/10/64



## GENERAL DYNAMICS CORPORATION

Financials Cont.  
 (Kaiser Corp.)  
 Consolidated  
 December 31, 1962

GOVERNMENT  
 EXHIBIT  
 REG. Dep.  
 4-A

## ASSETS

LINE	CLASSIFICATION	CODE	AMOUNT
1	CURRENT ASSETS		
2	CASH		11,508,382
3	GOVERNMENT & OTHER MARKETABLE SECURITIES		9,043,573
4	ACCOUNTS AND NOTES RECEIVABLE		
5	U.S. AND CANADIAN GOVERNMENTS		
6			
7	NOTES RECEIVABLE		6,300
8	OTHER TRADE RECEIVABLES		5,200,452
9	LESS-RESERVE FOR DOUBTFUL ACCTS.		12,746
10	NOTES AND OTHER TRADE REC.-NET		5,187,706
11			
12	INT./COMPANY RECEIVABLES-CURRENT		946,330
13			
14	UNRECOVERED EXPENDITURES AND ESTIMATED PROFITS ON CONTRACTS IN PROCESS		-
15			
16	INVENTORIES-		
17	FINISHED GOODS		54,566
18	WORK IN PROCESS		-
19	MATERIALS, PARTS AND SUPPLIES		-
20	TOTAL		54,566
21	LESS-ADVANCE AND PROGRESS PAYMENTS		-
22	INVENTORIES-NET		54,566
23			
24	ADVANCES TO VENDORS AND SUBCONTRACTORS		-
25	PREPAID EXPENSES		135
26			
27			
28	TOTAL		18,353,248
29	INVESTMENTS AND OTHER ASSETS		
30	INVESTMENTS AND ADVANCES-		
31	CONSOLIDATED SUBSIDIARIES		-
32	UNCONSOLIDATED SUBSIDIARIES		-
33	OTHER		397,374
34	NONCURRENT RECEIVABLES AND OTHER ASSETS		
35	NOTES RECEIVABLE		-
36	OTHER RECEIVABLES		1,375
37	USED AIRCRAFT LESS AMORTIZATION		-
38	OTHER ASSETS		31,528
39			
40			
41	TOTAL		419,903
42	PROPERTY, PLANT AND EQUIPMENT		
43	LAND		185,703
44	LAND IMPROVEMENTS		2,507,563
45	TOTAL LAND AND IMPROVEMENTS		2,693,266
46	BUILDINGS AND IMPROVEMENTS		
47	MACHINERY AND EQUIPMENT		28,748,148
48	CONSTRUCTION IN PROCESS		57,413
49	TOTAL		31,498,689
50	LESS-ACC. FOR DEPR. AND AMORTIZATION		24,679,700
51			
52	FIXED ASSETS-NET		6,818,989
53			
54	TOTAL		25,672,237

FD-302 (REVISED 2-5-62)

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11/10/68  
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GOVERNMENT  
EXHIBIT  
HQS 4-B

## GENERAL DYNAMICS CORPORATION

LIABILITIES,  
CAPITAL & SURPLUS
 COMPANY FORM  
 100-100-1  
 Filing Copy  
 DATE: Completed  
 December 31, 1968  
 \*\*\*\*\*

LINE	CLASSIFICATION	AMOUNT	CREDIT
1	CURRENT LIABILITIES		
2	NOTES PAYABLE TO BANKS		
3	CURRENT PORTION OF LONG-TERM DEBT		
4	OTHER NOTES PAYABLE		
5	ACCOUNTS PAYABLE	715	243
6	ACCRUED SALARIES AND WAGES	630	266
7	U.S. AND CANADIAN INCOME TAXES	905	027
8	OTHER ACCRUED TAXES	469	574
9	CONTRACT DEPOSITS AND ADVANCES IN EXCESS OF RELATED COSTS		
10	DEFERRED PAYABLES		
11	INTERCOMPANY PAYABLES - CURRENT	4,500	387
12			
13			
14	TOTAL	8,130	029
15	LONG-TERM DEBT & SEC. CURRENT INSTALLMENTS		
16			
17	NOTES PAYABLE		
18			
19	MORTGAGES PAYABLE		
20			
21	INTERCOMPANY PAYABLES		
22			
23	TOTAL		
24	MINORITY INTERESTS		
25	CAPITAL STOCK		
26			
27	SURPLUS		
28			
29	TOTAL		
30	INTERDIVISION ACCOUNTS		
31	CURRENT ACCOUNT		
32	CASH ACCOUNT		
33			
34	TOTAL		
35	CAPITAL STOCK AND SURPLUS		
36	CAPITAL STOCK OF GENERAL DYNAMICS		
37	PREFERRED		
38	COMMON		
39	CAPITAL STOCK OF CONSOLIDATED SUBS.		
40	PREFERRED	63	900
41	COMMON		
42			
43	CAPITAL SURPLUS		
44			
45	EARNED SURPLUS		
46	BALANCE AT BEGINNING OF YEAR	20,948	495
47			
48	PROFIT (LOSS) FOR THE PERIOD	2,200	429
49			
50	LESS DIVIDENDS	24,740	900
51	BALANCE AT END OF PERIOD	24,822	000
52	TOTAL		
53		20,628	827
54	TOTAL		

F-10 (REVISED 9-68)

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 GOVERNMENT  
 EXHIBIT  
 Reg. Dep.  
 4-C

## GENERAL DYNAMICS CORPORATION

 General Dynamics  
 Building Corp.  
 1000 15th St.  
 Washington, D.C. 20004

## PROFIT AND LOSS

1517

LINE	CLASSIFICATION	Q196	Q197
1	SALES, LESS RETURNS		30,230,000
2	DISCOUNTS		
3	ALLOWANCES		317,000
4	NET SALES		30,133,000
5	COST OF SALES		
6	MATERIAL, LABOR AND OVERHEAD	26,300,000	
7	UNDERWORKS ASSIGNED OVERHEAD		
8	SELLING AND ADVERTISING EXPENSE		
9	GENERAL AND ADMINISTRATIVE EXPENSE	517,179	
10	RESEARCH AND DEVELOPMENT EXPENSE	625,400	
11	COMP. OFFICE & GEN. STAFFING EXPENSE		
12			
13	TOTAL	27,442,579	
14			
15	OPERATING PROFIT (LOSS)	2,690,421	
16	OTHER INCOME (DEDUCTIONS)		
17	DIVIDENDS -		
18	CONSOLIDATED SUBSIDIARIES		
19	UNCONSOLIDATED SUBSIDIARIES		
20	OTHER		200
21	INCENTIVE COMPENSATION CREDIT		
22	CYLINDER DAMAGE		
23	INTEREST INCOME		200,000
24	GAIN ON SALE -		
25	SECURITIES		
26	FIXED ASSETS	5,000	
27	ROYALTIES		
28			
29			
30	INTEREST EXPENSE		
31	INCENTIVE COMPENSATION PROVISION		
32	MINORITY INTERESTS		
33			
34	OTHER INCOME		15,000
35	OTHER INCOME (DEDUCTIONS) - NET		315,000
36	PROFIT (LOSS) BEFORE TAXES		3,005,421
37			
38	PROVISION FOR INCOME TAXES		300,000
39			
40	NET PROFIT (LOSS)		2,705,421
41	BREAKDOWN OF NET SALES		
42	RESTRICTED		
43	UNRESTRICTED		30,133,000
44	TOTAL (FYR LINE 4)		30,133,000
45	INTERIM AND INTERCO. TRANSACTIONS		
46	INTERIM/INTERCO. SALES		
47	INTERCOMPANY-		
48	SALES		2,705,421
49	INTEREST INCOME RESPONSE		
50			
51	DEPRECIATION, AMORTIZATION AND DEPLETION		
52	PROPERTY, PLANT AND EQUIP.		2,705,421
53	DEPLETION IN EXCESS OF COST BASIS		
54	USED AIRCRAFT		
55			

PART DISCLOSED 2-20

For Corporate Office Use Only

 August  
 1964  
 4-C  
 9/10/64

GOVERNMENT  
EXHIBIT  
Aug. Dep.  
5-A

## GENERAL DYNAMICS CORPORATION

## ASSETS

LINE	CLASSIFICATION	CODE	AMOUNT
1	CURRENT ASSETS		
2	CASH		7,205,711
3	GOVERNMENT & OTHER INSURANCE & SECURITIES		611,475
4	ACCOUNTS AND NOTES RECEIVABLE		
5	U.S. AND CANADIAN GOVERNMENTS		
6			
7	NOTES RECEIVABLE		
8	OTHER TRADE RECEIVABLES		3,354,405
9	LESS-RESERVE FOR DOUBTFUL ACCTS.		17,745
10	NOTES AND OTHER TRADE RECEIVABLES		3,336,660
11			
12	INTERCOMPANY RECEIVABLES-CURRENT		3,370,836
13			
14	UNRECORDED EXPENDITURES AND ESTIMATED PROFITS ON CONTRACTS IN PROCESS		
15			
16	INVENTORIES		95,853
17	FINISHED GOODS		
18	WORK IN PROCESS		
19	MATERIALS, PARTS AND SUPPLIES		95,853
20	TOTAL		95,853
21	LESS-ADVANCE AND PROGRESS PAYMENTS		95,853
22	INVENTORIES-NET		
23			
24	ADVANCES TO VENDORS AND SUBCONTRACTORS		15,774
25	PREPAID EXPENSES		
26			
27			
28	TOTAL		17,043,022
29	INVESTMENTS AND OTHER ASSETS		
30	INVESTMENTS AND ADVANCES		
31	CONSOLIDATED SUBSIDIARIES		
32	UNCONSOLIDATED SUBSIDIARIES		521,679
33	OTHER		
34	GOVERNMENT RECEIVABLES AND OTHER ASSETS		
35	NOTES RECEIVABLE		
36	OTHER RECEIVABLES		
37	LESS-ASSETT LIME AMORTIZATION		19,040
38	OTHER ASSETS		
39			
40	TOTAL		572,229
41	PROPERTY, PLANT AND EQUIPMENT		
42	LAND		155,433
43	LAND IMPROVEMENTS		2,277,743
44	TOTAL LAND AND IMPROVEMENTS		2,433,176
45	BUILDINGS AND IMPROVEMENTS		2,654,075
46	MACHINERY AND EQUIPMENT		27,972,723
47	CONSTRUCTION IN PROCESS		
48	TOTAL		32,579,974
49	LESS-RES. FOR DEPR. AND AMORTIZATION		10,659,774
50	FIXED ASSETS-NET		21,920,200
51			
52	TOTAL		33,573,022

GOVERNMENT  
EXHIBIT  
Reg. Dep.  
5-1

## GENERAL DYNAMICS CORPORATION

LIABILITIES,  
CAPITAL & SURPLUS

LINE	CLASSIFICATION	DEBIT	CREDIT	AMOUNT
1	CURRENT LIABILITIES:			
2	NOTES PAYABLE TO BANKS			
3	CURRENT PORTION OF LONG-TERM DEBT			
4	OTHER NOTES PAYABLE			
5	ACCOUNTS PAYABLE			
6	ACCUMULATED DEPRECIATION AND AMORTIZATION			
7	U.S. AND CANADIAN INCOME TAXES			
8	OTHER ACCRUED TAXES			
9	CONTRACT DEFERRED AND ADVANCES IN RECEIVABLES OF SUBSIDIARY COSTS			
10	DIVIDENDS PAYABLE			
11	INTERCOMPANY PAYABLES - CURRENT			
12				
13				
14	TOTAL			
15	LONG-TERM DEBT (LESS CURRENT INSTALLMENTS)			
16				
17	NOTES PAYABLE			
18				
19	MORTGAGES PAYABLE			
20				
21	INTERCOMPANY PAYABLES			
22				
23	TOTAL			
24	MINORITY INTERESTS			
25	CAPITAL STOCK			
26				
27	RENTALS			
28				
29	TOTAL			
30	INTERVIEW ACCOUNTS			
31	CURRENT ACCOUNT			
32	CASH ACCOUNT			
33				
34	TOTAL			
35	CAPITAL STOCK AND SURPLUS			
36	CAPITAL STOCK OF GENERAL DYNAMICS			
37	PREFERRED			
38	COMMON			
39	CAPITAL STOCK OF CONSOLIDATED SUBS.			
40	PREFERRED			
41	COMMON			
42				
43	CAPITAL SURPLUS			
44				
45	PAID SURPLUS -			
46	BALANCE AT BEGINNING OF YEAR			
47				
48	PROFIT (LOSS) FOR THE PERIOD			
49				
50	LESS DIVIDENDS			
51	BALANCE AT END OF PERIOD			
52	TOTAL			
53				
54	TOTAL			

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GOVERNMENT  
EXHIBIT  
Reg. Dep.  
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## GENERAL DYNAMICS CORPORATION

## PROFIT AND LOSS

LINE	CLASSIFICATION	CODE	AMOUNT
1	SALES, LESS RETURNS		2,532,503
2	DISCOUNTS		-
3	ALLOWANCES		2,532,503
4	NET SALES		2,532,503
5	COST OF SALES		
6	NATIONAL, LABOR AND OVERHEAD		28,273,120
7	UNDER LICENSE AGREEMENT OVERHEAD		
8	SELLING AND ADVERTISING EXPENSE		310,924
9	GENERAL AND ADMINISTRATIVE EXPENSE		758,000
10	RESEARCH AND DEVELOPMENT EXPENSE		
11	COMP. OFFICE & GEN. ATOMIC DIV. EXPENSE		
12			
13	TOTAL		29,342,044
14			
15	OPERATING PROFIT (LOSS)		1,190,459
16	OTHER INCOME (DEDUCTIONS)		
17	DEVICES -		
18	CONSOLIDATED SUBSIDIARIES		
19	UNCONSOLIDATED SUBSIDIARIES		
20	OTHER		730
21	INCENTIVE COMPENSATION CREDIT*		
22	CYLINDER DAMAGE		
23	INTEREST INCOME		311,174
24	GAIN ON SALE -		
25	SECURITIES		13,014
26	FIXED ASSETS		
27	ROYALTIES		
28			
29	INTEREST EXPENSE		(187,000)
30	INCENTIVE COMPENSATION PROVISION		
31	MINORITY INTERESTS		
32			
33	OTHER INCOME		(3,272)
34	OTHER INCOME (DEDUCTIONS) - NET		101,000
35	PROFIT (LOSS) BEFORE TAXES		2,133,014
36			
37	PROVISION FOR INCOME TAXES		205,000
38			
39	NET PROFIT (LOSS)		1,928,014
40	BREAKDOWN OF NET SALES		
41	RESTRICTED		
42	UNRESTRICTED		2,532,503
43	TOTAL (FOR LINE 4)		2,532,503
44	INTEREST AND INTEREST TRANSACTIONS		
45	INTERVIEWING SALARIES		
46	INTERCOMPANY -		
47	SALES		1,372,523
48	INTEREST INCOME (EXPENSE)		30,450
49			
50	DEPRECIATION, AMORTIZATION AND DEPLETION		2,321,943
51	PROPERTY, PLANT AND EQUIP.		
52	DEPLETION IN CASES OF COST BASIS		1,610,927
53	USED AIRCRAFT		
54			

NOT REPRODUCED

\* For Corporate Office Use Only

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EXHIBIT  
Reg. Dep.  
6-4

## GENERAL DYNAMICS CORPORATION

## BALANCE SHEET

Terminated 12/30/60

Filing Date

Date

December 31, 1960

LINE	CLASSIFICATION	AMOUNT	
1	CASH	9,470	979
2	MARKETABLE SECURITIES	2,875	813
3	RECEIVABLES - (ALLOWANCE)	-	-
4	INVENTORY - (ALLOWANCE)	9,572	979
5	PREPAID EXPENSES	-	-
6	DEFERRED TAXES	-	-
7	LONG TERM INVESTMENTS	-	-
8	NET INVESTMENTS	-	-
9	PROPERTY, PLANT AND EQUIPMENT	2,770	813
10	ACCUMULATED DEPRECIATION	3,000	700
11			
12			
13	TOTAL CURRENT ASSETS	32,917	579
14	INVESTMENTS AND ADVANCES	-	-
15	RECEIVABLES - (ALLOWANCE) AND OTHER ASSETS	-	-
16			
17	PROPERTY, PLANT AND EQUIPMENT - GROSS	31,770	813
18	- NET	28,770	813
19			
20	TOTAL ASSETS	32,917	579
21			
22	NOTES PAYABLE - BANKS	-	-
23	LONG TERM DEBT - (ALLOWANCE)	-	-
24	ACCOUNTS PAYABLE AND ACCRUED EXPENSES	3,199	900
25	DEFERRED INCOME TAXES	700	579
26	U.S. AND FOREIGN INCOME TAXES	3,000	900
27	DEFERRED TAXES	-	-
28	INVESTMENTS	-	-
29	DEFERRED INCOME TAXES	1,700	579
30			
31	TOTAL CURRENT LIABILITIES	4,899	900
32			
33	LONG TERM DEBT - (ALLOWANCE)	-	-
34	DEFERRED INCOME TAXES	-	-
35	DEFERRED INCOME TAXES	-	-
36	DEFERRED INCOME TAXES	-	-
37	DEFERRED INCOME TAXES	-	-
38	DEFERRED INCOME TAXES	-	-
39	DEFERRED INCOME TAXES	-	-
40	DEFERRED INCOME TAXES	-	-
41	DEFERRED INCOME TAXES	-	-
42	DEFERRED INCOME TAXES	-	-
43	DEFERRED INCOME TAXES	-	-
44	DEFERRED INCOME TAXES	-	-
45	DEFERRED INCOME TAXES	-	-
46	DEFERRED INCOME TAXES	-	-
47	DEFERRED INCOME TAXES	-	-
48	DEFERRED INCOME TAXES	-	-
49	DEFERRED INCOME TAXES	-	-
50	DEFERRED INCOME TAXES	-	-
51	DEFERRED INCOME TAXES	-	-
52	DEFERRED INCOME TAXES	-	-
53	DEFERRED INCOME TAXES	-	-
54	DEFERRED INCOME TAXES	-	-
55	DEFERRED INCOME TAXES	-	-
56	DEFERRED INCOME TAXES	-	-
57	DEFERRED INCOME TAXES	-	-
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74	DEFERRED INCOME TAXES	-	-
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83	DEFERRED INCOME TAXES	-	-
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189	DEFERRED INCOME TAXES	-	-
190	DEFERRED INCOME TAXES	-	-
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192	DEFERRED INCOME TAXES	-	-
193	DEFERRED INCOME TAXES	-	-
194	DEFERRED INCOME TAXES	-	-
195	DEFERRED INCOME TAXES	-	-
196	DEFERRED INCOME TAXES	-	-
197	DEFERRED INCOME TAXES	-	-
198	DEFERRED INCOME TAXES	-	-
199	DEFERRED INCOME TAXES	-	-
200	DEFERRED INCOME TAXES	-	-

REPORT FROM

Filing Corp.

DATE

December 31, 1960

FD-136



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Reg. Dep.  
6-B

## GENERAL DYNAMICS CORPORATION

## INCOME STATEMENT

Period 1/1/68

REPORT FROM  
GENERAL DYNAMICS CORPORATION  
DATE  
December 31, 1968

LINE	MONTH	AMOUNT
1		
2	IN. F. SALES	3 031 040
3		
4	DEPRECIATION & AMORTIZATION	142 600
5		
6	OTHER INCOME (EXCLUSIONS)	523 000
7		
8	PRIOR TAX PROFIT LOSS	240 650
9		
10	PROVISION FOR INCOME TAXES	142 570
11		
12	NET INCOME (LOSS)	2.0 277
13		
14	SALES - INTERCOMPANY	1.3 040
15	- INTERDIVISION	-
16		
17	STATISTICAL DATA	
18	NET SALES (LINE 2)	3 031 040
19	INTERCOMPANY DIVISION SALES	-
20	DIVISION SALES BASE	3 031 040
21		
22		
23		
24	YEAR TO DATE	
25		
26	NET SALES	31 017 203
27		
28	OTHER INCOME (EXCLUSIONS)	722 277
29		
30	OTHER INCOME (EXCLUSIONS)	403 000
31		
32	PRIOR TAX PROFIT LOSS	1 222 600
33		
34	PROVISION FOR INCOME TAXES	716 570
35		
36	NET INCOME (LOSS)	1 627 407
37		
38		
39	SALES - INTERCOMPANY	-
40	- INTERDIVISION	31 017 203
41	TOTAL (LINE 26)	31 017 203
42	SALES - INTERCOMPANY	-
43	- INTERDIVISION	-
44	INTEREST EXPENSE (INCOME) - NET	107 000
45	DEPRECIATION, AMORTIZATION, ETC.	2 350 000
46	DEFERRED INCOME TAXES	1 005 577
47		
48	STATISTICAL DATA	
49	NET SALES (LINE 26)	31 017 203
50	INTERCOMPANY DIVISION SALES	-
51	DIVISION SALES BASE	31 017 203
52		
53		
54		
55		
REPORT FROM		GENERAL DYNAMICS CORPORATION
DATE		December 31, 1968

August  
by Ex 6-B  
JF  
7/10/68

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1965  
GENERAL DYNAMICS CORPORATION  
BALANCE SHEET

REPORT FROM  
Proton Coal  
Mining Corp.  
DATE

GOVERNMENT  
EXHIBIT  
Nug. Dep.  
7-A

December 31, 1965

LINE	CLASSIFICATION	AMOUNT	AMOUNT
1	CASH	3	169 940
2	MARKETABLE SECURITIES	3	201 636
3	RECEIVABLES - GOVERNMENT		
4	- TRADE (LESS RESERVE)	3	355 586
5	DEFERRED EXPENDITURES		
6	INVENTORIES		110 813
7	LESS: ADVANCE AND PROGRESS PAYMENTS		
8	NET INVENTORIES		110 813
9	PREPAID EXPENSES		18 832
10	INTERCOMPANY RECEIVABLES	2	789 794
11			
12			
13	TOTAL CURRENT ASSETS	11	146 605
14			
15	INVESTMENTS AND ADVANCES		306 875
16	INTEREST IN OTHER COMPANIES AND OTHER ASSETS		21 652
17			
18	PROPERTY, PLANT AND EQUIPMENT - GROSS	35	931 305
19	- NET	13	612 522
20			
21	TOTAL ASSETS	25	867 658
22	Production Payment - Net of Taxes	X	3 965 000
23	PAID IN CAPITAL - TO SHARE		
24	CURRENT INSTALLMENTS ON LONG-TERM DEBT		
25	ACCOUNTS PAYABLE AND ACCRUED EXPENSES	2	521 489
26	ACCUMULATED DEPRECIATION AND VALUATION		707 436
27	U.S. AND CANADIAN INCOME TAXES	X	1 668 672
28	CUSTOMER DEPOSITS		
29	INTEREST PAYABLE		
30	INTERCOMPANY PAYABLES		369 741
31			
32	TOTAL CURRENT LIABILITIES	X	8 913 328
33	Deferred Federal Income Tax		880 849
34	UNRECORDED DEBT (LESS CURRENT PORTION)		
35	MINORITY INTERESTS		
36			
37	INTERVIEWER ACCOUNTS		
38			
39	UNRECORDED DEBT - INTERCOMPANY		
40	- INTERVIEWER		
41			
42	SHAREHOLDERS' EQUITY		
43	PAYMENTS:		
44	CASH		63 905
45	(TREASURY) AND PAID UP		
46	CAPITAL SURPLUS		
47			
48	EARNED SURPLUS, BEGINNING OF YEAR	28	115 352
49	NET INCOME (LOSS)	2	114 220
50	INCREASE - RETIREMENT		
51	CASH	14	600 000
52			
53	PAID IN CAPITAL, BEGINNING OF YEAR	14	627 572
54	TOTAL SHAREHOLDERS' EQUITY	14	693 477
55	TOTAL LIABILITIES AND EQUITY	24	867 658

REPORT FROM

Proton Coal  
Mining Corp.

DATE

December 31, 1965

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GOVERNMENT  
EXHIBIT  
Aug. Dep.  
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GENERAL DYNAMICS CORPORATION  
INCOME STATEMENT

REPORT OF  
MINING CORP.  
DATE  
December 31, 1965

LINE	MONTH	THIRTY
1	NET SALES	3 078 370
2	OPERATING PROFIT (LOSS)	279 726
3	OTHER INCOME (DEDUCTIONS)	(14 473)
4	PRETAX PROFIT (LOSS)	(294 199)
5	PROVISION FOR INCOME TAXES	(610 128)
6	NET INCOME (LOSS)	315 929
7	SALES - INTERCOMPANY	235 874
8	- INTERDIVISION	-
9	STATISTICAL DATA	
10	NET SALES (LINE 1)	3 078 370
11	LESS: SUPPORT DIVISION SALES	-
12	DIVISION SALES BASE	3 078 370
13	Dividend Income	250
14	YEAR TO DATE	
15	NET SALES	31 665 837
16	OPERATING PROFIT (LOSS)	10 630
17	OTHER INCOME (DEDUCTIONS)	166 462
18	PRETAX PROFIT (LOSS)	177 092
19	PROVISION FOR INCOME TAXES	(937 128)
20	NET INCOME (LOSS)	3 134 220
21	SALES - NONNEGOTIABLE	-
22	- NONNEGOTIABLE	31 665 837
23	TOTAL (LINE 20)	31 665 837
24	SALES - INTERCOMPANY	2 060 860
25	- INTERDIVISION	-
26	INTEREST EXPENSE (INCOME) - NET	(179 821)
27	DEPRECIATION, AMORTIZATION, ETC.	2 344 192
28	DEFLECTION IN EXCESS OF COST - Book Income	1 083 554
29	- Tax Return (Ref.)	1 134 486
30	STATISTICAL DATA	
31	NET SALES (LINE 20)	31 665 837
32	LESS: SUPPORT DIVISION SALES	-
33	DIVISION SALES BASE	31 665 837
34	Interest Credit	178 584
35	Dividend Income	300
36	REPORT FROM	Freeman Coal Mining Corp.
37	DATE	December 31, 1965

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## GENERAL DYNAMICS CORPORATION

## BALANCE SHEET

PERIOD ENDING  
31/12/75  
DATE 12/31/76

LINE	CLASSIFICATION	AMOUNT
1	CASH	5 514 776
2	MARKETABLE SECURITIES	-
3	RECEIVABLES - GOVERNMENT	-
4	" " TRADE (LESS DISCOUNTS)	4 247 705
5	UNRECOVERED EXPENDITURES	-
6	DEFERRED	-
7	LESS: ADVANCE AND PROVISION PAYMENTS	51 490
8	NET INVESTMENTS	-
9	PROPERTY EXPENSES	51 490
10	INTERCOMPANY RECEIVABLES	17 493
11		574 135
12		
13		
14	TOTAL CURRENT ASSETS	12 403 300
15	INVESTMENTS (COST) AND ADVANCES - SUBSIDIARIES	-
16	CURRY, INCOME OF CURRY - UNRECOVERED REMAINDERS	-
17	NON-CURRENT RECEIVABLES AND OTHER ASSETS	272 351
18	PROPERTY, PLANT AND EQUIPMENT - GROSS	38 084 498
19	RESERVE FOR DEPRECIATION AND AMORTIZATION	25 115 923
20	PROPERTY, PLANT AND EQUIPMENT - NET	12 968 575
21		
22	TOTAL ASSETS	31 644 426
23	Production Payable - Net of Taxes	8 773 240
24	NOTES PAYABLE TO U.S. BANKS	-
25	NOTES PAYABLE TO CANADIAN BANKS	-
26	CURRENT INSTALLMENTS ON LONG-TERM DEBT	-
27	ACCOUNTS PAYABLE AND ACCRUED EXPENSES	2 543 231
28	ACCUMULATED SALARIES AND WAGES	965 544
29	U.S. AND CANADIAN INCOME TAXES	1 114 357
30	CUSTOMERS' DEPOSITS	-
31	DIVIDENDS PAYABLE	-
32	INTERCOMPANY PAYABLES	653 156
33		
34	TOTAL CURRENT LIABILITIES	14 012 134
35	LONG-TERM DEBT (LESS CURRENT PORTIONS)	-
36	DEFERRED INCOME TAX	815 401
37	MINORITY INTERESTS	-
38		
39	INTERDIVISION ACCOUNTS	-
40		
41	UNREALIZED PROFIT - INTERCOMPANY	-
42	" " INTERDIVISION	-
43		
44	SHARE OWNER'S EQUITY	
45	CAPITAL STOCK	63 305
46	TREASURY STOCK	-
47	CAPITAL SURPLUS	-
48		
49	EARNED SURPLUS, BEGINNING OF YEAR	14 629 572
50	NET INCOME (LOSS)	1 125 252
51	DIVIDENDS - CAPITAL STOCK	(4 000 260)
52		
53		
54	EARNED SURPLUS, END OF PERIOD	9 754 564
55	TOTAL SHARE OWNERS' EQUITY	9 818 562
56	TOTAL LIABILITIES AND EQUITY	24 644 426

REPORT PERIOD

Frederick Coal  
Mining Corp.

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GENERAL DYNAMICS CORPORATION  
INCOME STATEMENT

REPORT FROM  
FINANCIAL DATA  
DATE 12/31/66  
\*\*\*\*\*

LINE	AMOUNT	
1		MONTHS
2		NET SALES
3	3	581 113
4	3	COST OF SALES 492 799
5		OPERATING PROFIT (LOSS) 143 344
6		OTHER INCOME (EXPENSE)
7		EARNINGS FROM UNCONSOLIDATED SUBSIDIARIES
8		INTEREST INCOME
9		INTEREST EXPENSE
10		INTERCOMPANY/INTERDIVISION INCOME (EXPENSE)
11		MISCELLANEOUS NET
12		
13		PRETAX PROFIT (LOSS) 207 100
14		PROVISION FOR INCOME TAXES (560 189)
15		NET INCOME (LOSS) 767 289
16		
17		SALES - INTERCOMPANY
18		- INTERDIVISION
19		
20		INVESTMENT INCOME
21		
22		
23		YEAR TO DATE
24		NET SALES 34 343 920
25		COST OF SALES 34 400 713
26		
27		OPERATING PROFIT (LOSS) (56 783)
28		OTHER INCOME (EXPENSE)
29		EARNINGS FROM UNCONSOLIDATED SUBSIDIARIES
30		INTEREST INCOME
31		INTEREST EXPENSE
32		INTERCOMPANY/INTERDIVISION INCOME (EXPENSE)
33		MISCELLANEOUS NET
34		
35		PRETAX PROFIT (LOSS) 40 211
36		PROVISION FOR INCOME TAXES (1 085 051)
37		NET INCOME (LOSS) 1 123 252
38		
39		SALES - INTERCOMPANY
40		- INTERDIVISION
41		
42		INVESTMENT INCOME
43		
44		SALES - INTERDIVISION
45		- NONRECOGNIZABLE
46		TOTAL (LINE 25) 34 343 920
47		
48		STATISTICAL DATA
49		NET SALES (LINE 25) 34 343 920
50		LESS: SUPPORT DIVISION SALES
51		DIVISION SALES BASE
52		
53		DEPRECIATION, AMORTIZATION, ETC.
54		DEFERRED IN PROGRESS OF COST
55		DIVIDENDS RECEIVED - FROM SUBSIDIARIES
56		- OTHER
57		
58		
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62		
63		
64		
65		
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REPORT FROM

FROMER COAL  
Mining Corp.

DATE

12/31/66



1967

## GENERAL DYNAMICS CORPORATION

## BALANCE SHEET

 FORM 1001  
 BALANCE SHEET  
 DATE 12/31/67

 GOVERNMENT  
 FORM 1001  
 9-A

 82-10  
 1597

LINE	CLASSIFICATION	AMOUNT
1	CASH	82 343
2	MARKETABLE SECURITIES	-
3	RECEIVABLES - GOVERNMENT	-
4	" TRADE (LESS RESERVE)	-
5	UNRECOVERED EXPENDITURES	3 803 653
6	INVENTORIES	-
7	LESS: ADVANCE AND PROGRESS PAYMENTS	94 564
8	NET INVENTORIES	-
9	PREPAID EXPENSES	94 585
10	INTERCOMPANY RECEIVABLES	16 246
11		4 284 677
12		
13	TOTAL CURRENT ASSETS	8 384 315
14		
15	INVESTMENTS (COST) AND ADVANCES - SUBSIDIARIES	-
16	EQUITY INTERESTS OF COST - UNDEVELOPED MINERALS	-
17	NON-CURRENT RECEIVABLES AND OTHER ASSETS	367 378
18		
19	PROPERTY, PLANT AND EQUIPMENT - GROSS	40 829 873
20	RESERVE FOR DEPRECIATION AND AMORTIZATION	27 188 163
21	PROPERTY, PLANT AND EQUIPMENT - NET	13 641 712
22		
23	TOTAL ASSETS	22 393 673
24	Production Payable - Rec of Terms	1 643 533
25	NOTES PAYABLE TO U.S. BANKS	-
26	NOTES PAYABLE TO CANADIAN BANKS	-
27	CURRENT INSTALLMENTS ON LONG-TERM DEBT	-
28	ACCOUNTS PAYABLE AND ACCRUED EXPENSES	2 762 587
29	ACCRUED SALARIES AND WAGES	-
30	U.S. AND CANADIAN INCOME TAXES	887 736
31	CUSTOMERS' DEPOSITS	12 165 033
32	DIVIDENDS PAYABLE	-
33	INTERCOMPANY PAYABLES	98 369
34		
35		
36	TOTAL CURRENT LIABILITIES	10 367 394
37		
38	LONG-TERM DEBT (LESS CURRENT PORTION)	-
39	DEFERRED INCOME TAX	1 162 848
40	MINORITY INTERESTS	-
41		
42	INTERDIVISION ACCOUNTS	-
43		
44	UNREALIZED PROFIT - INTERCOMPANY	-
45	" INTERDIVISION	-
46		
47	SHARE OWNER'S EQUITY	
48	CAPITAL STOCK	63 703
49	TREASURY STOCK	-
50	CAPITAL SURPLUS	-
51		
52	EARNED SURPLUS, BEGINNING OF YEAR	9 754 784
53	NET INCOME (LOSS)	1 037 762
54	DIVIDENDS - CAPITAL STOCK	-
55		
56		
57		
58	EARNED SURPLUS, END OF PERIOD	10 812 546
59	TOTAL SHARE OWNER'S EQUITY	10 876 249
60	TOTAL LIABILITIES AND EQUITY	22 293 673

REPORT FROM

 Atlasman Coal  
 Mining Corp.

Prosser Coal  
Mining Corp.  
12/31/67

AMOUNT

2	867	355
3	248	161

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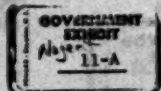
		1966	
10	NET INCOME		(694)
11	MISCELLANEOUS	(5)	(881)
12	PRETAX PROFIT	(184)	(701)
13	PROVISION FOR INCOME TAXES	(4)	(320)
14	NET INCOME (LOSS)	(180)	(881)
15	SALES - INTERCOMPANY	440	670
16	- INTERDIVISION	-	-
17	INVESTMENT CREDIT	(11)	(129)
18			
19			
20	YEAR TO DATE		
21	NET SALES	36	714 037
22	COST OF SALES	36	534 590
23			
24	OPERATING PROFIT (LOSS)	179	547
25	OTHER INCOME (EXPENSE)	-	-
26	EARNINGS FROM UNCONSOLIDATED SUBSIDIARIES	-	-
27	INTEREST INCOME	7	847
28	INTEREST EXPENSE	-	(494)
29	INTERCOMPANY/INTERDIVISION INCOME (EXPENSE)	-	-
30	MISCELLANEOUS NET	(483)	(728)
31	PRETAX PROFIT (LOSS)	(428)	(828)
32	PROVISION FOR INCOME TAXES	(1)	(536 520)
33	NET INCOME (LOSS)	1	857 742
34			
35	SALES - INTERCOMPANY	3	811 320
36	- INTERDIVISION	-	-
37	INVESTMENT CREDIT	75	554
38			
39	SALES - NONNEGOTIABLE	-	-
40	- NONNEGOTIABLE	36	714 037
41	TOTAL (LINE 35)	36	714 037
42			
43	STATISTICAL DATA		
44	NET SALES (LINE 35)	36	714 037
45	LESS: SUPPORT DIVISIONS SALES	-	-
46	DIVISION SALES BASE	36	714 037
47			
48	DEPRECIATION, AMORTIZATION, ETC.	2	261 340
49	DEPLETION IN EXCESS OF COST	1	164 521
50	DIVIDENDS RECEIVED - FROM SUBSIDIARIES	-	-
51	- OTHERS	-	500
52			
53			
54			
55			
56			
57			
58			
59			
60			
REPORT FROM		Prosser Coal Mining Corp.	
DATE		12/31/67	

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DATE

12/31/67

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 GENERAL DYNAMICS CORPORATION  
 INCOME STATEMENT

 Federal Corp  
 Mining Corporation  
 DATE 12/31/48  
 624665522

LINE		MONTH	PERCENT
1	NET SALES	2	566 975
2	COST OF SALES	2	534 710
3	OPERATING PROFIT (LOSS)		
4	OTHER INCOME (EXPENSE)		12 269
5	EARNINGS FROM UNCONSOLIDATED SUBSIDIARIES		
6	INTEREST INCOME		
7	INTEREST EXPENSE		475
8	INTERCOMPANY/INTERDIVISION INCOME (EXPENSE)		
9	MISCELLANEOUS NET		(48 736)
10	PRETAX PROFIT (LOSS)		
11	PROVISION FOR INCOME TAXES		(35 992)
12	NET INCOME (LOSS)		(146 230)
13			110 238
14	SALES - INTERCOMPANY		
15	- INTERDIVISION		260 224
16			
17	INVESTMENT CREDIT		(10 036)
18			
19			
20	YEAR TO DATE		
21	NET SALES	33	411 154
22	COST OF SALES	34	154 030
23	OPERATING PROFIT (LOSS)		
24	OTHER INCOME (EXPENSE)		(762 826)
25	EARNINGS FROM UNCONSOLIDATED SUBSIDIARIES		
26	INTEREST INCOME		
27	INTEREST EXPENSE		9 895
28	INTERCOMPANY/INTERDIVISION INCOME (EXPENSE)		
29	MISCELLANEOUS NET		(866 866)
30	PRETAX PROFIT (LOSS)		
31	PROVISION FOR INCOME TAXES	(1	603 847)
32	NET INCOME (LOSS)	(2	396 424)
33			792 157
34	SALES - INTERCOMPANY	2	945 430
35	- INTERDIVISION		
36			
37	INVESTMENT CREDIT		374 047
38			
39	SALES - RENEGOTIABLE		
40	- NONRENEGOTIABLE	33	411 154
41	TOTAL (LINE 25)	33	411 154
42			
43	STATISTICAL DATA		
44	NET SALES (LINE 25)	33	411 154
45	LESS: SUPPORT DIVISION SALES		
46	DIVISION SALES BASE	33	411 154
47			
48	DEPRECIATION, AMORTIZATION, ETC.		
49	DEPLETION IN EXCESS OF COST	2	354 777
50	DIVIDENDS RECEIVED - FROM SUBSIDIARIES		
51	- OTHERS		500
52			
53			

 REPORT FROM FEDERAL CORP  
 Mining Corporation  
 12/31/48

1600

12/31/68

GOVERNMENT  
EXHIBIT  
11-B

## GENERAL DYNAMICS CORPORATION

## BALANCE SHEET

THOMSON COOL  
MINI-CORPORATION

12/31/68

(DOLLARS)			
LINE	CLASSIFICATION	AMOUNT	
1	CASH	66	25
2	MARKETABLE SECURITIES		
3	RECEIVABLE - GOVERNMENT		
4	- TRADE (LESS RESERVES)	3	509 95
5	UNRECOVERED EXPENDITURES		
6	INVENTORIES	140	61
7	LESS: ADVANCE AND PROGRESS PAYMENTS		
8	NET INVENTORIES	140	61
9	PREPAID EXPENSES	18	73
10	INTERCOMPANY RECEIVABLES	11	133 82
11			
12			
13	TOTAL CURRENT ASSETS	14	871 42
14			
15	INVESTMENTS (COST) AND ADVANCES - SUBSIDIARIES		
16	EQUITY IN EXCESS OF COST - UNCONSOLIDATED SUBSIDIARIES		
17	NON-CURRENT RECEIVABLES AND OTHER ASSETS	236	61
18	EQUIPMENT LEASED TO OTHERS		
19	PROPERTY, PLANT AND EQUIPMENT - GROSS	47	805 82
20	RESERVE FOR DEPRECIATION AND AMORTIZATION	28	792 71
21	PROPERTY, PLANT AND EQUIPMENT - NET	19	133 00
22			
23	TOTAL ASSETS	34	243 13
24			
25	NOTES PAYABLE TO U.S. BANKS		
26	NOTES PAYABLE TO CANADIAN BANKS		
27	COMMERCIAL PAPER		
28	DRAFTS PAYABLE		
29	CURRENT INSTALLMENTS ON LONG-TERM DEBT		
30	ACCOUNTS PAYABLE AND ACCRUED EXPENSES	3	703 05
31	PRODUCTION PAYMENTS - NET OF TAXES	14	321 98
32	ACCRUED SALARIES AND WAGES	1	274 52
33	U.S. AND CANADIAN INCOME TAXES	1	392 33
34	CUSTOMERS' DEPOSITS		
35	DIVIDENDS PAYABLE		
36	INTERCOMPANY PAYABLES	75	03
37			
38	TOTAL CURRENT LIABILITIES	20	772 23
39	LONG-TERM DEBT (LESS CURRENT PORTION)		
40	OTHER LIABILITIES		
41	DEFERRED REVENUE FROM ASSIGNED LEASES		
42	DEFERRED INCOME TAX	1	801 91
43	MINORITY INTERESTS		
44	INTERDIVISION ACCOUNTS		
45			
46	UNREALIZED PROFIT - INTERCOMPANY		
47	- INTERDIVISION		
48			
49	SHARE OWNERS' EQUITY		
50	CAPITAL STOCK	63	95
51	TREASURY STOCK		
52	CAPITAL SURPLUS		
53			
54	EARNED SURPLUS, BEGINNING OF YEAR	10	812 52
55	NET INCOME (LOSS)		792 52
56	DIVIDENDS - CAPITAL STOCK		
57			
58	EARNED SURPLUS, END OF PERIOD	11	605 10
59	TOTAL SHARE OWNERS' EQUITY	11	659 00
60	TOTAL LIABILITIES AND EQUITY	34	243 13

REPORT FROM

THOMSON COOL  
MINI-CORPORATION

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DATE

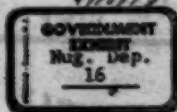
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# 1967 KEYSTONE COAL BUYERS MANUAL

A McGraw-Hill Publication

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McGraw-Hill Mining Publications

Coal Age—Engineering & Mining Journal—Mined Week

Keystone Coal Buyers Manual—Coal Atlas Directory—Monthly News Bulletin Service

JOHN B. ENERY, Publisher

Mining Publications

ALFRED E. FLOWERS, Editor

Keystone Coal Buyers Manual

Coal Age

GEORGE F. NIELSEN, General Manager

Keystone Coal Buyers Manual

Coal Atlas Directory

Monthly News Bulletin Service

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330 West 42d St., New York, N.Y. 10036



1767

## Deep Mined Co. No. 6 Seam in Southern and Centr.

distinguished for their basic character and  
excellent preparation for electric utility, industrial,  
metallurgical and heating uses



### ORIENT NO. 3 JEFFERSON COUNTY, SOUTHERN ILLINOIS



Shipping point Orient Mine No. 3, Illinois. Daily capacity 14,000 tons. One of the largest mines in the country. Famed for quality and excellence of preparation. The lowest ash low sulphur coal in Illinois for metallurgical, electric utility, industrial and heating applications. Extensive reserves.

### ORIENT NO. 4 WILLIAMSON COUNTY, SOUTHERN ILLINOIS



Shipping point Orient Mine No. 4, Illinois. Daily capacity 7,000 tons. A special feature of this mine is its attractive glossy-black, firm structure coal, unusually low in moisture and high in Btu content. A popular dealer coal as well as a long-time favorite with utilities and industries.

### ORIENT NO. 5 FRANKLIN COUNTY, SOUTHERN ILLINOIS



Shipping point West Frankfort, Illinois. Daily capacity 7,000 tons. Freeman's newest mine, highly automated for unusually precise control of both quality and sizing. Orient No. 5 coal is a low moisture, high Btu product, highly desirable for utility, industrial and heating uses.

### CROWN MINE SOUTHEASTERN COUNTY, CENTRAL ILLINOIS



Shipping point Crown, Illinois. Daily capacity 10,000 tons. The largest air-cleaning plant in the country plus unusually versatile preparation facilities capable of meeting varied market requirements. Crown coal is widely used by utilities and industries, and also has a large and loyal dealer following.

Distributors of Choice High and Low Volatile Coals from Eastern Kentucky and West Virginia

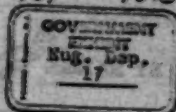
## FREEMAN COAL MINING CORPORATION

A DIVISION OF GENERAL DYNAMICS CORPORATION / 301 N. Maple St. • Chicago, Ill. 60611 • JMW 3-2000

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... J. H. J. Sep 17, 1967 9/17/67

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# 1967 KEYSTONE COAL BUYERS MANUAL

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GEO. F. WILSEN, General Manager

Keystone Coal Buyers Manual

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330 West 42d St., New York, N.Y. 10036

BY BARGE



on the Inland Waterways

BY LAKE VESSEL



to Great Lakes Ports

BY RAIL



to all Middle West Points

BY TRUCK



for Local Area Delivery

## UNITED ELECTRIC COALS for ELECTRIC UTILITIES and BASIC INDUSTRIES

### BANNER—Direct Barge-Loading Coal Mine.

Premium quality heavy media washed coal.

Banner Seam, Peoria County, Illinois

### CUBA-SUCKHEART

Heavy media, washed and heat dried coals.

Fulton County, Illinois, No. 5 Seam.

### FIDELITY

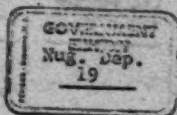
Washed and heat dried coals.

Perry County, Illinois, No. 6 Seam.

### THE UNITED ELECTRIC COAL COMPANIES

A DIVISION OF GENERAL DYNAMICS CORPORATION, 207 S. WILSON ST., CHICAGO, ILL. 60606 • CEN 4-5281

KEYSTONE COAL BUYERS MANUAL



1968

# KEYSTONE COAL BUYERS MANUAL

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McGraw-Hill Mining Publications

Coal Age—Engineering & Mining Journal—Mining Week

Keystone Coal Buyers Manual—Coal Mine Directory—Monthly News Bulletin Service

JOHN R. EMERY, Publisher  
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Coal Age

GEORGE F. NIELSEN, General Manager

Keystone Coal Buyers Manual  
Coal Mine Directory  
Monthly News Bulletin Service

McGraw-Hill, Inc.  
330 West 42d St., New York, N.Y. 10036

## UNITED ELECTRIC COALS for Electric Utilities and Basic Industries

by Barge on Inland Waterways  
by Rail to Middle West Points  
by Truck for Local Area Delivery



### BANNER MINE PEORIA COUNTY, ILLINOIS



Shipping point Banner, Illinois. Banner No. 2 Seam. Daily capacity 4,000 tons. A direct barge-loading mine, producing heavy medium washed coal for commercial, industrial, and heating markets.

### FIDELITY MINE PEABODY COUNTY, ILLINOIS



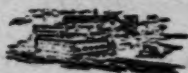
Shipping point Pinckneyville, Illinois. No. 6 Seam. Daily capacity 8,000 tons. An unusually versatile preparation plant producing required sizes of washed and heat-dried coal.

### BUCKHEART MINE FULTON COUNTY, ILLINOIS



Shipping point Canton, Illinois. No. 5 Seam. Daily capacity 9,000 tons. A heavy medium preparation plant with its own rail facilities to transport coal to barge-loading dock at Liverpool.

### CUBA MINE FULTON COUNTY, ILLINOIS



Shipping points Cuba and Lewistown, Illinois. No. 5 Seam. Daily capacity 4,500 tons. Produces high-quality washed and heat-dried coals primarily for electric utilities and industries.

## THE UNITED ELECTRIC COAL COMPANIES

A SUBSIDIARY OF GENERAL DYNAMICS CORPORATION / 207 N. Michigan Ave. • Chicago, Ill. 60601 • TELEX 9-2888

KEYSTONE COAL BUYERS MANUAL



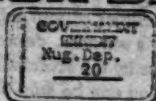
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719127 Sep. 22, 20, Id. 9/11/68

CHICAGO/NEW YORK

# THE BLACK DIAMOND

62-151607

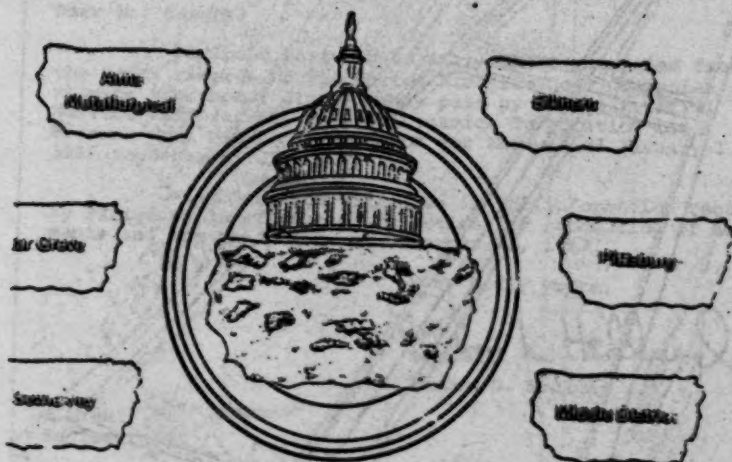


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FEBRUARY, 1968

Our 33rd year

## Industry Matched Quality Coals from CAPITOL FUEL



Supplier of Quality Coal for 49 years

THE CAPITOL

FUEL COMPANY

Leader Building



Cleveland, Ohio 44114

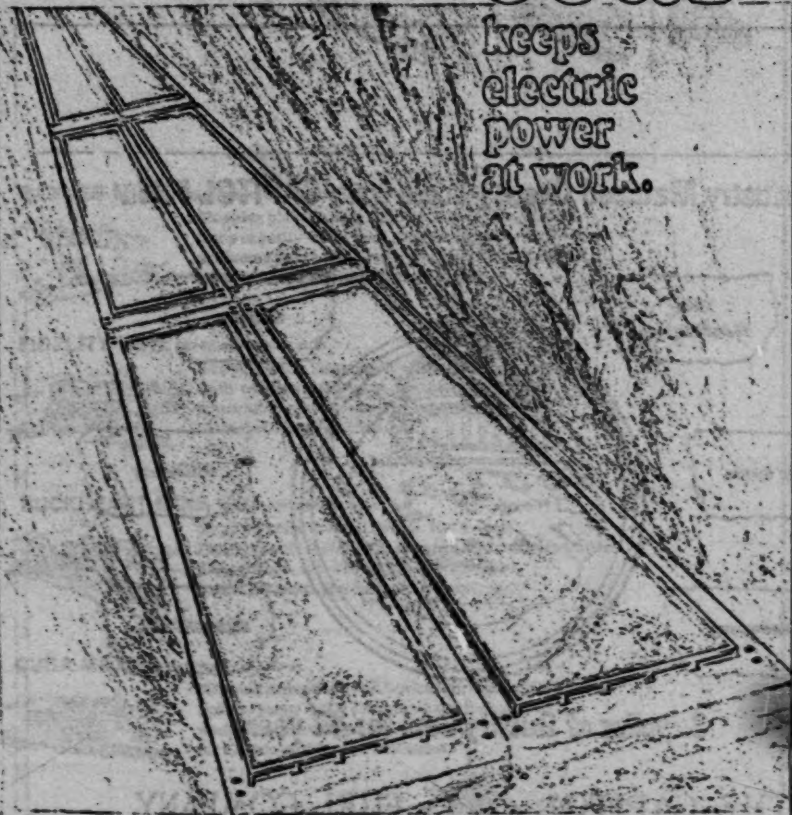
Telephone: 621-2200

Area Code: 216

*Huge production facilities at four mines and flexibility of distribution key-note United Electric's efficient, dependable service to electric utilities and industries. Shipments by the economical all-water route on the inland waterways and by rail. You can be sure of large tonnages for the big job coal's got to do—today and tomorrow.*

# united electric coal

keeps  
electric  
power  
at work.



**THE UNITED ELECTRIC COAL COMPANIES**

A SUBSIDIARY OF GENERAL DYNAMICS CORPORATION / 307 S. Dearborn Ave. • Chicago, Ill. 60601 • CEN-6-6000

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CHICAGO, ILLINOIS 60601

TELEPHONE BRADLAW 9-2200

WASHINGTON OFFICE  
WORLD CENTER BUILDING

GOVERNMENT  
EXHIBIT  
Reg. Dep.  
22

February 13, 1968

John T. Cusack, Esquire  
Attorney, Midwest Office  
Antitrust Division  
Department of Justice  
Room 2634 United States Courthouse  
219 South Dearborn Street  
Chicago, Illinois 60604

Re: United States v. General Dynamics, et al.

Dear Mr. Cusack:

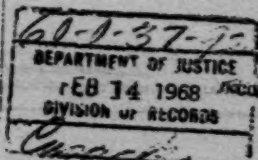
Enclosed herewith is a statement, compiled from the stock records of The United Electric Coal Companies showing the amount of dividends paid by UEC to Material Service Corporation, General Dynamics Corporation and Freeman Coal Mining Corporation for the period January 1, 1950 to December 27, 1967.

We understand that this is the information requested by Paragraph 18 of your draft motion for production of documents and our conference on December 11, 1967.

Very truly yours,

*Rauben L. Hedlund*  
Rauben L. Hedlund

RLH:ew  
Enclosure



## THE UNITED ELECTRIC COAL COMPANIES

DIVIDENDS PAID ON THE COMMON STOCK OF THE UNITED ELECTRIC COAL COMPANIES BY YEAR TO MATERIAL SERVICE CORPORATION, GENERAL DYNAMICS CORPORATION, AND FREEMAN COAL MINING CORPORATION FOR THE PERIOD JANUARY 1, 1950 TO DECEMBER 27, 1967.

YEAR	AMOUNT OF DIVIDENDS PAID TO			TOTAL
	MATERIAL SERVICE CORP.	GENERAL DYNAMICS	FREEMAN COAL	
1966	\$ 456,844.05	\$ 6,043,650.00	-	\$ 6,500,494.05
1965	609,125.40	29,160.00	-	638,285.40
1964	609,125.40	29,160.00	-	638,285.40
1963	418,115.40	29,160.00	-	447,305.40
1962	406,530.25	28,350.00	-	434,880.25
1961	371,684.80	25,920.00	-	397,604.80
1960	371,684.80	12,400.00	-	384,084.80
1959	295,996.80	-	-	295,996.80
1958	265,060.80	-	-	265,060.80
1957	234,846.35	-	-	234,846.35
1956	161,963.00	-	-	161,963.00
1955	112,117.25	-	-	112,117.25
1954	20,675.00	-	-	20,675.00
1953	-	-	-	-
1952	-	-	-	-
1951	-	-	-	-
1950	-	-	-	-
TOTAL	\$ 4,363,829.30	\$ 6,197,800.00	-	\$ 10,561,629.30

Plant Deposition No. 1776

# ANNUAL REPORT

JOHN D. AXES  
Chicago, Illinois

LIVING TOWN  
Chicago, Illinois

MILTON F. KOFF  
Chicago, Illinois

BARTON R. GEBHART  
Chicago, Illinois

DUDLEY F. JESSOP  
Chicago, Illinois

JOHN M. MORRIS  
Chicago, Illinois

FRANK NUGENT  
Chicago, Illinois

THOMAS J. TAREY  
Chicago, Illinois

REUBEN THOMSON  
Chicago, Illinois

## OFFICERS

JOHN M. MORRIS  
President

R. J. HEFEURN  
Vice President—Operations

THOMAS J. TAREY  
Vice President—Sales

G. M. UTTERBACK  
Secretary

JOHN T. MURRAY  
Treasurer

WILLIAM B. HAUBOLD  
Controller

CARL A. HOLM  
Assistant Treasurer

G. A. ALDERSON  
Assistant Secretary

## RESULTS OF YEAR YEAR ENDED JULY 31

	1934	1933
Tonnage	\$22,281,256 \$5,544,151	\$19,904,888 4,947,875
Income		
Amount	\$ 3,333,343	\$ 1,844,408
Percentage of sales	15.0%	15.3%
Per share	\$ 1.80	\$ 1.80
DIVIDENDS		
Amount	\$ 1,213,050	\$ 1,213,050
Per share	\$ 1.80	\$ 1.80
WORKING CAPITAL		
At year end	\$ 5,332,333	\$ 2,880,967
LONG-TERM DEBT		
At year end	\$ -	\$ 515,500
STOCKHOLDERS		
Equity at year end	\$27,517,533	\$24,703,250
Per share	\$ 40.00	\$ 38.80
Number at year end	1,355	1,515
EMPLOYEES		
Number at year end	375	654
Average hourly earnings	\$ 4.21	\$ 3.58

TRANSFER AGENT: The Chase Manhattan Bank  
REGISTRAR: Chemical Bank New York Trust Company

EXECUTIVE OFFICES: 117 N. MICHIGAN AVE., CHICAGO, ILL. • ST. LOUIS, MO. • PEORIA, ILL.

MINN. BANNER: GLASSBORO, N.J. • COLUMBIAN: CANTON, ILL. • CHICAGO: CHICAGO, ILL. • CINCINNATI: DU QUOIN, ILL. • HART MOORE: DANVILLE, ILL.

Conventions in the past have been held at various places, including Chicago.



1964 was a very good year for your Company, as you will see from the following pages. Good operating conditions at all of our mining properties contributed substantially to the results. Increased sales to our customers made it possible to produce a record of 5,562,886 tons. Details of the year's results are presented under "Review of the Year."

Whenever possible, we continue to reclaim land which has been mined and put it to the use for which it is best adapted. Color photographs on the cover of this report show some of the recreational facilities that have been established and are being used.

Most of the responsible strip coal mine operators are doing this. The enclosed brochure produced by the Mined Land Conservation Conference shows the variety and extent of land reclamation activities in many states. Your Company is a member of the Conference and contributes both time and money as well as the talents of our organization to this work.

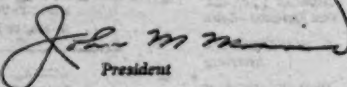
The coal industry must continue to exert every effort to maintain and increase its proportion of the energy market. This will require the use of every means of reducing mining costs and the full cooperation of all transportation agencies to achieve the lowest possible delivered costs at point of use. We believe that our competitive position can be maintained in the territory served by your Company.

Approximately 60% of our production is shipped via the inland waterways. Railroads are making a determined effort to compete with water-borne coal and substantial reductions in their freight rates have been made in recent months. We continue to watch this development closely and endeavor to retain our competitive relationship in the market areas served by our mines.

Sales and production at all of our properties continue currently on a very satisfactory basis and we are optimistic about the future of the coal industry.

We have always had the full and sincere cooperation of our entire organization and we are grateful to our shareholders, members of our Board of Directors, and all employees for their interest and efforts on behalf of the Company.

Respectfully submitted,

  
President

September 11, 1964

New heat dryer unit at Fidelity Mine reduces moisture content of the coal and increases...

Sales of the Company were the highest on record - \$92,391,226. Net income was \$3,233,343, equivalent to \$4.80 per share. Progress over the past ten years is shown on Page 12 and inside back cover of this Annual Report.

At the end of our fiscal year 1963, bank loans amounted to \$1,708,199 and all of this was retired during the year ended July 31, 1964.

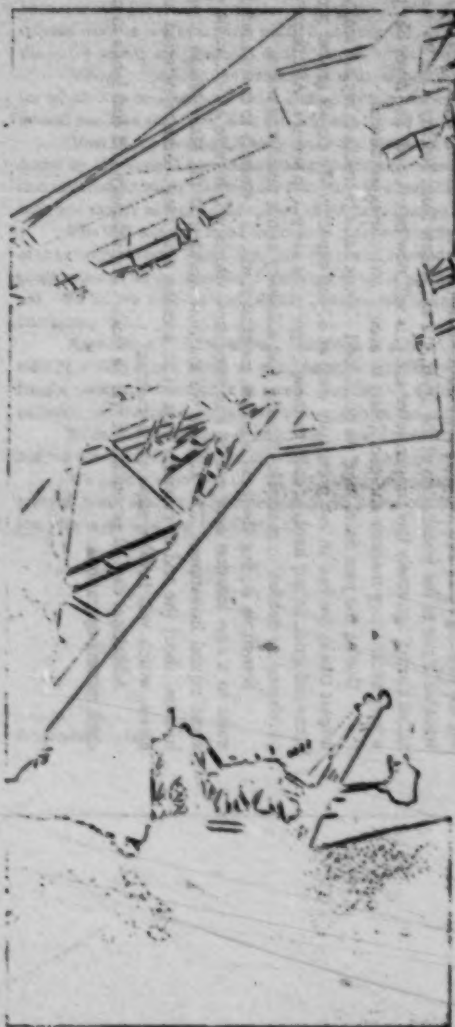
**DIVIDENDS** The dividend rate of \$1.80 per share are annually was continued throughout the past year, starting in February of 1964. A new heat dryer was installed at the Fidelity Mine and started operating the heating value and avoiding the extreme difficulties of unloading frozen coal in severe winter weather. Prior to the installation of the dryer, our shipments from Fidelity Mine were seriously curtailed during extremely low temperatures and this will now be avoided. The dryer has performed in a very satisfactory manner and completely in accordance with our expectations.

During the past fiscal year, we purchased 130-ton haulage trucks to replace smaller units. The largest trucks we had in use previously were of 60-ton capacity. We expect greater production and some reduction in our haulage costs as these larger units are put in service. Additional units will be purchased as needed to maintain capacity and efficiency at our producing mines.

Sometime during the next eighteen months, it will be necessary to move some heavy equipment to a new location near one of our properties, which will involve considerable expense and some capital investment. The acreage we are now working at the Mary Moore Mine will be exhausted about the end of calendar year 1964 and the equipment there transferred to other properties, which will involve expense in moving.

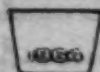
Additional capital expenditures will be made in machinery and coal lands to maintain efficient mining operations.

# PRODUCTION OF UNITED ELECTRIC COALS



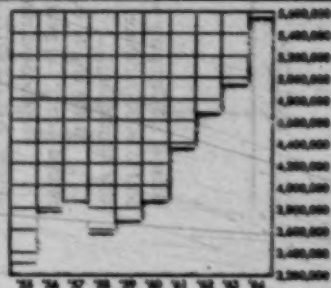
As indicated below, our production has continued to grow year by year, showing an increase of 12 1/4 % for the year ended July 31, 1964 over the previous fiscal year ended July 31, 1963.

BY MINES—TONS



		1963
Cuba . . . . .	840,871	804,880
Rockhart . . . . .	1,848,864	1,306,465
Fidelity . . . . .	1,898,040	1,804,447
Banner . . . . .	717,084	608,158
Mary Moore . . . . .	263,837	265,282
	<u>5,568,696</u>	<u>4,946,232</u>

BY YEARS—TONS

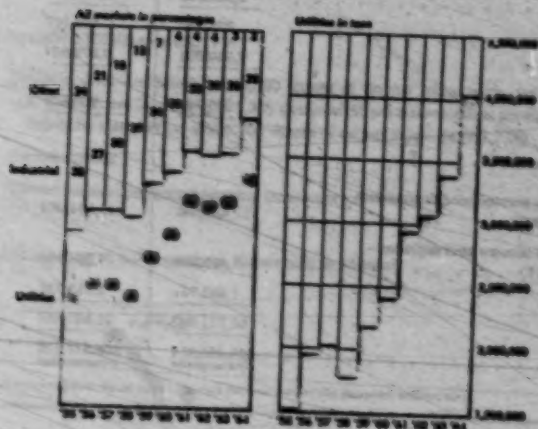


**COAL DEPOSITS** At the year end July 31, 1964, our coal renewable savings was 145,400,000 tons, of which 96,300,000 tons are available for mining by the strip method and 49,100,000 tons of underground coal. During the fiscal year, we added to our available strip savings just about the amount produced by all of our mines.

**CHANGE IN FISCAL YEAR** For some time it has appeared desirable to change our fiscal year end from July 31 to December 31. This will make it easier to comply with the requirements of various governmental bureaus and to compare results of the Company with those of other coal producers and industries. The change was authorized by the Board of Directors during the past fiscal year. The interim statement for the five months period ending December 31, 1964 will be sent to our shareholders and also incorporated in our Annual Report for the calendar year 1965, which will be our next fiscal year.

**PERSONNEL** Without loss of working time, an amended wage agreement was negotiated last spring with the United Mine Workers of America whereby wages were increased \$1.00 per day on April 2, 1964 and an additional \$1.00 per day on January 1, 1965. Vacation pay was increased from \$200 to \$225 beginning with payments in June, 1964. The new agreement is terminable on sixty days' notice by either party on or after March 31, 1966.

## CONSUMPTION OF UNITED ELECTRIC COALS



Practically our entire increase in sales last year occurred in shipments to public utilities. 72% of our production was sold in this market, 25% to industrial consumers, and the balance of 3% to others. We continue to direct our sales efforts toward maintaining and increasing our proportion of the utility and industrial markets.

New 100-ton capacity coal handling units improve speed and efficiency of coal-handling operations. ➔

## BALANCE SHEET JULY 31, 1964 AND 1963

## ASSETS

JULY 31

## CURRENT ASSETS:

	1964	1963
Cash . . . . .	\$ 1,563,607	\$ 1,336,507
Bank certificates of deposit . . . . .	2,000,000	—
Accounts receivable (less allowance for possible losses, \$50,000) . . . . .	1,885,976	1,767,276
Inventories:		
Coal on hand, at lower of cost or market . . . . .	196,250	269,817
Drilling, blasting, and stripping costs of coal in process of being mined, at average cost . . . . .	366,830	409,343
Repair parts, operating supplies, etc., at average cost or lower (less allowance for obsolescence, \$70,000) . . . . .	1,641,111	1,580,507
Total inventories . . . . .	2,234,200	2,349,667
Prepaid expenses . . . . .	275,880	406,117
Total current assets . . . . .	7,969,603	5,973,657

## INVESTMENTS, ETC.

755,784 755,809

## PROPERTY, PLANT, AND EQUIPMENT:

Buildings, machinery, etc., at cost (less accumulated depreciation—1964, \$21,834,445; 1963, \$19,061,390) . . . . .	11,626,501	13,004,063
Coal lands and rights, etc., at cost (less accumulated depletion—1964, 66,287,856; 1963, \$5,912,417) . . . . .	7,602,295	7,564,853
Advance mining royalties—net . . . . .	1,482,731	1,013,737
	30,711,527	21,582,653
TOTAL . . . . .	\$29,456,914	\$28,311,119



## LIABILITIES

JULY 31

## CURRENT LIABILITIES:

	1964	1963
Notes payable . . . . .	\$ —	\$ 1,212,748
Accounts payable and accrued expenses . . . . .	736,066	602,617
Federal income taxes . . . . .	917,181	341,453
Accrued salaries and wages, etc. . . . .	472,534	431,388
Dividends payable . . . . .	303,264	303,264
Total current liabilities . . . . .	2,429,045	3,091,670

NOTES PAYABLE, ETC. . . . .	—	515,500
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## STOCKHOLDERS' EQUITY:

Common stock—authorized, 750,000 shares of \$5 per value each; issued 677,920 shares (including 306,000 shares of \$5 per value each at previous aggregate stated value of 306,000 shares of no par value, \$4,657,318) . . . . .	6,516,918	6,516,918
Capital surplus . . . . .	1,350,691	1,350,691
Earned surplus, per accompanying statement . . . . .	19,244,885	16,921,466
	27,121,494	24,798,075
Deduct—cost of 4,000 common shares held in treasury . . . . .	94,225	94,225
TOTAL . . . . .	27,027,269	24,703,850
	<u>\$29,456,914</u>	<u>\$26,311,119</u>

The notes appearing on page 11 are an integral part of the financial statements.

## STATEMENT OF INCOME AND EARNED SURPLUS

THE UNITED ELECTRIC COAL COMPANIES  
FOR THE YEARS ENDED JULY 31, 1964 AND 1963

YEAR ENDED JULY 31

	1964	1963
Sales-Net . . . . .	\$22,301,326	\$19,904,586
Operating Costs and Expenses (exclusive of depreciation and depletion):		
Cost of mining . . . . .	13,493,460	12,508,026
Selling, general, and administrative expenses . . . . .	1,080,757	1,103,481
	<u>14,574,217</u>	<u>13,611,507</u>
Profit from Operations, before Deducting Depreciation and Depletion . . . . .	<u>7,817,009</u>	<u>6,293,079</u>
Deduct:		
Depreciation . . . . .	3,127,923	3,059,585
Depletion . . . . .	<u>233,241</u>	<u>189,882</u>
	<u>3,361,164</u>	<u>3,249,467</u>
Profit from Operations . . . . .	<u>4,455,845</u>	<u>3,043,612</u>
Income Charges and Credits:		
Provision for Federal income taxes (1963, after reduction of \$125,000 shown below) . . . . .	1,375,000	780,000
Interest expense . . . . .	39,915	125,583
Profit on sale of equipment (less applicable income taxes, \$125,000) . . . . .	—	369,550
Other income charges and credits-net . . . . .	<u>192,478</u>	<u>116,802</u>
	<u>1,607,493</u>	<u>1,291,935</u>
Net Income for the Year . . . . .	<u>2,848,352</u>	<u>1,751,677</u>
Earned Surplus at Beginning of the Year . . . . .	16,921,466	15,490,120
Investment Credit Applicable to Prior Years . . . . .	<u>303,127</u>	—
	<u>20,457,941</u>	<u>18,134,522</u>
Deduct—Dividends (\$1.80 per share) . . . . .	<u>1,213,056</u>	<u>1,213,056</u>
Earned Surplus at End of the Year . . . . .	<u>\$19,244,885</u>	<u>\$16,921,466</u>

## NOTES

**1. INVESTMENTS** Included in investments is the cost, \$730,000, of the Company's investment in capital stocks of affiliates engaged in barge operations. The Company's equity in the combined net assets of those affiliates at the close of their fiscal year exceeded its investments therein. These barge affiliates had loans of \$3,483,345 at July 31, 1964 and the owners of those affiliates in effect guarantee that the revenues will be sufficient to repay the installments of these loans. In connection with such guarantee, the Company has also agreed to maintain working capital of \$1,750,000. At July 31, 1964, the Company had working capital of \$5,559,958.

**2. INVESTMENT CREDIT** Investment credit applicable to prior years, which had been treated as a reduction of property at July 31, 1963, has been reversed in 1964 and credited to earned surplus.

**3. COMMITMENTS** At July 31, 1964, the Company had commitments of approximately \$2,450,000 for advance royalty payments on long-term coal leases and \$950,000 for future payments on option contracts to purchase coal lands, of which approximately \$850,000 is payable in the twelve months ending July 31, 1965.

## ACCOUNTANTS' REPORT

## THE UNITED ELECTRIC COAL COMPANIES

We have examined the balance sheet of The United Electric Coal Companies as of July 31, 1964 and the related statement of income and earned surplus for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the accompanying balance sheet and statement of income and earned surplus present fairly the financial position of the Company at July 31, 1964 and the results of its operations for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

HARRIS & FELL  
Certified Public Accountants

Chicago, September 11, 1964

STATEMENT OF INCOME AND EARNED SURPLUS

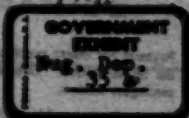
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1. The Company has a policy of not making any statement or disclosure of information that might be considered material to the Company's financial position or performance, or that might be considered material to the Company's business, unless the information is required by law or the Company is required to disclose the information by the SEC. The Company's policy is to disclose information only when it is required to do so by law or the SEC.

1786

**GENERAL DYNAMICS CORPORATION**

ONE ROCKEFELLER PLAZA  
NEW YORK, N. Y. 10020



**INVITATION FOR TENDERS  
OF COMMON STOCK OF  
THE UNITED ELECTRIC COAL COMPANIES  
AT \$30.00 PER SHARE**

To the Holders of Common Stock of  
THE UNITED ELECTRIC COAL COMPANIES:

General Dynamics Corporation ("General Dynamics") invites the holders of Common Stock of The United Electric Coal Companies ("UEC"), upon the terms and conditions set forth in this invitation, in the enclosed Form of Tender and Assignment and on the reverse thereof, to tender shares of Common Stock of UEC for purchase by General Dynamics at the price of \$30.00 per share in cash, net to the seller. No charges for brokers' commissions or state transfer taxes will be made to stockholders of UEC for transfer of their shares to General Dynamics.

General Dynamics will pay to any member of a registered national securities exchange or of the National Association of Securities Dealers, Inc. whose name appears on the Form of Tender and Assignment as soliciting broker a fee of 50¢ per share for each share tendered thereby and purchased pursuant to this invitation for Tenders.

This offer expires at 5:00 p.m., Eastern Daylight Saving Time, on Tuesday, October 25, 1964, and tenders must be received at the office of The Chase Manhattan Bank (National Association), Tender Agent, 80 Pine Street, 2nd Floor, New York, N. Y., on or before said date, provided, however, that General Dynamics may, at its option, by notice to the Tender Agent, extend the period for tenders from time to time until not later than Monday, November 21, 1964.

If 170,000 or more shares are properly tendered prior to the expiration of the initial or extended tender period, General Dynamics will be obligated, subject to the conditions hereof, to purchase all shares tendered.

Whether or not the period for tenders is extended, if less than 170,000 shares are tendered during the period within which tenders may be made, General Dynamics is not obligated to purchase any of the shares tendered, but it reserves the right to purchase all or any part of the shares tendered. If General Dynamics purchases fewer than all such shares tendered, purchases will be pro-rated and the same proportion of shares will be purchased from each tendering stockholder (except that, in the event that pro-ration of shares tendered will result in a return of ten shares or less to any stockholder, General Dynamics reserves the right to retain and purchase all such shares). Any provision will be effected in such a way as to eliminate the purchase of fractional shares.

All tenders are irrevocable until the shares are purchased or returned as provided in this invitation for Tenders. In order to take advantage of this offer stockholders of UEC should act promptly. You should either:

1. Send the enclosed Form of Tender and Assignment properly filled out, executed and accompanied by your stock certificate(s) and any necessary supporting documents, as set forth in the instructions on the reverse of the Form of Tender and Assignment, to The Chase Manhattan Bank (National Association), Corporate Agency Department, 80 Pine Street, 2nd Floor, New York, N. Y. 10015 (registered mail is suggested); or

2. Request your broker or bank to complete the transaction for you.



Payment for shares purchased pursuant to this limitation will be made promptly after expiration of the tender period. General Dynamics reserves the right to reject any alternative, conditional or contingent tender.

At December 31, 1965, directors of UEC as a group owned 2,400 shares of Common Stock of UEC; such directors are eligible to participate in this offer.

General Dynamics owns 445,773 shares of Common Stock of UEC, which is 66.15% of the outstanding shares. General Dynamics first acquired ownership of UEC shares through its acquisition on December 31, 1959 of Mineral Service Corporation, which then owned 232,303 such shares. Since that date General Dynamics has from time to time acquired 213,470 additional shares, either on the open market or by privately negotiated purchases, at prices ranging from \$31.125 to \$50.50 per share and averaging \$45.83 per share.

If General Dynamics acquires 165,000 shares or more of UEC Common Stock it will own in excess of 90% of the outstanding stock of UEC, and presently intends to acquire complete ownership of the business of UEC. Under the laws of Delaware, in which UEC is incorporated, a corporation owning 90% or more of the shares of another corporation may merge the latter into itself by filing a certificate of ownership and merger authorized by the board of directors of the parent corporation. If such action is taken the certificate would specify the cash or other consideration to be paid upon the surrender of the shares held by the minority. Any stockholder objecting to such a merger and demanding payment for his stock as provided in Section 253(a) of the Delaware General Corporation Law would be entitled to be paid the value of his stock on the date of the recording of the certificate, exclusive of any element of value arising from the expectation or accomplishment of the merger, all as provided in said Section 253(a).

Currently the number of publicly held shares of UEC fails to meet the New York Stock Exchange criteria for continued listing. The Exchange has informed UEC that October 24, 1966 has been tentatively set as the date when trading in UEC stock on the Exchange will be suspended.

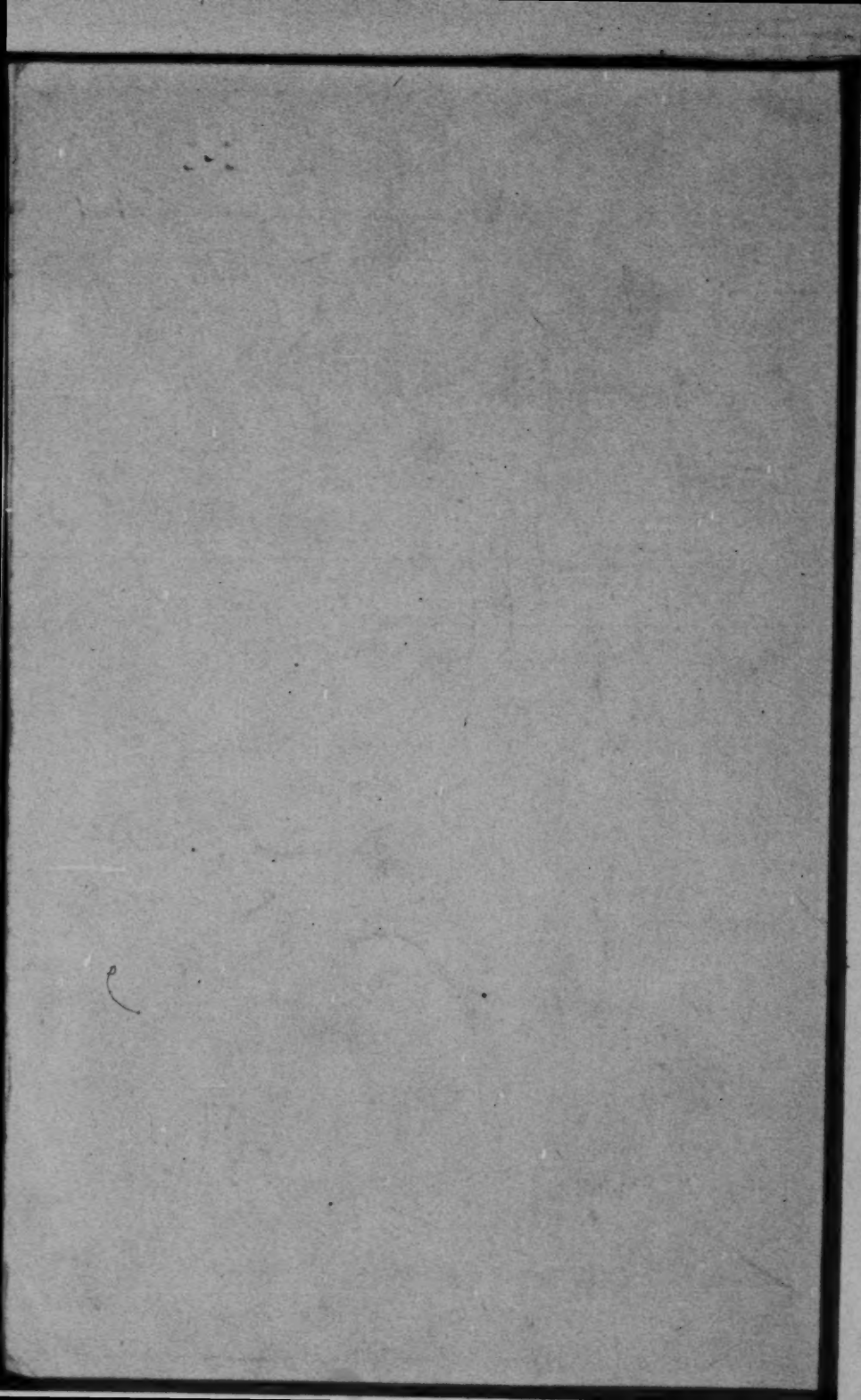
#### Business and Operations of The United Electric Coal Companies

UEC is engaged in the production and sale of bituminous coal which is marketed in the Chicago, St. Louis and other Midwestern industrial areas.

The following summary of earnings of UEC for the years 1961 through 1965 has been prepared from the financial information contained in UEC's 1965 Annual Report to Stockholders. The information set forth for the nine-month periods ended September 30, 1965 and 1966, has not been audited, but in the opinion of UEC's management presents fairly the results of operations for such periods. Reference is made to the balance sheet of UEC at December 31, 1965, which was included in the 1965 Annual Report, and the unaudited balance sheet at September 30, 1966, and related notes, all of which are appended hereto. Copies of such 1965 Annual Report will be sent upon request.

#### SUMMARY OF EARNINGS

	Fiscal Year Ended July 31		Year Ended Dec. 31		Nine Months Ended September 30 (Unaudited)	
	1961	1962	1963	1964	1965	1966
	(in Thousands, except per share amounts)					
Net Sales	\$16,157	\$19,026	\$19,980	\$23,196	\$21,884	\$15,676
Earnings Before Income Taxes	2,639	3,209	3,729	5,054	3,410	3,994
Provision for Income Taxes	1,080	1,030	683	1,573	930	583
Net Earnings	2,639	2,677	3,644	3,479	2,480	3,410
Depreciation and Depletion	1,780	2,229	2,340	3,389	3,420	2,504
Per Share or Common Share						
Net Earnings	\$ 3.20	\$ 3.64	\$ 3.56	\$ 5.16	\$ 3.66	\$ 3.70
Dividends Paid	1.60	1.60	1.00	1.20	1.20	1.35
Stockholders' Equity	28.29	34.83	36.68	41.77	42.68	43.53



# TEN YEAR RECORD

OPERATING AND FINANCIAL DATA

THE UNITED ELECTRIC

	Tons Produced and Sold	Net Sales	Depreciation and Depletion	Earnings Before Income Taxes	Provision for Income Taxes	Net Earnings	Shares of Common Stock Outstanding	Per Share of Common Stock			Working Capital	Coal Lands, Plant and Equipment, Less Depreciation and Depletion	Long-term Indebtedness
								Earnings	Dividends Declared	Stockholders' Equity			
1964	5,584,151	\$22,391,226	\$3,361,164	\$4,608,348	\$1,375,000	\$3,233,348	673,920	\$4.80	\$1.80	\$40.10	\$5,559,958	\$20,711,527	\$ —
1963	4,947,875	19,904,586	3,249,467	3,529,402	885,000	2,644,402	673,920	3.92	1.80	36.66	2,890,987	21,582,653	515,5
1962	4,633,630	19,055,659	2,859,346	3,505,236	1,050,000	2,455,236	673,920	3.64	1.70	34.53	3,190,498	21,140,096	1,989,7
1961	4,343,530	18,135,466	1,699,882	3,629,853	1,000,000	2,629,853	673,920	3.90	1.60	32.59	3,284,855	20,334,453	2,442,5
1960	3,839,634	16,021,572	1,524,827	2,342,472	480,000	1,862,472	673,920	2.76	1.60	30.29	3,096,638	20,105,940	3,380,5
1959	3,669,677	15,770,289	1,551,849	2,611,313	800,000	1,811,313	673,920	2.69	1.60	29.12	2,772,358	16,694,704	1,200,0
1958	3,591,309	15,454,725	1,590,946	2,335,664	787,000	1,548,664	673,920	2.30	1.60	28.04	2,538,648	15,361,414	—
1957	3,890,842	16,300,572	1,678,375	3,004,006	960,000	2,044,006	677,920	3.02	1.30	27.32	3,438,544	13,298,913	180,0
1956	3,789,349	14,960,424	1,421,641	2,311,556	650,000	1,661,556	677,920	2.45	1.00	25.60	3,179,295	13,204,764	—
1955	3,325,759	12,476,899	1,378,718	897,332	212,400	684,932	677,920	2.45	1.00	24.15	2,516,334	13,704,308	573,1



# RECORD

## OPERATING AND FINANCIAL DATA

## THE UNITED ELECTRIC COAL COMPANIES

	Depreciation and Depletion	Earnings Before Income Taxes	Provision for Income Taxes	Net Earnings	Shares of Common Stock Outstanding	Per Share of Common Stock			Working Capital	Coal Lands, Plant and Equipment, Less Depreciation and Depletion	Long-term Indebtedness	Net Assets	Coal Deposits —Tons
						Earnings	Dividends Declared	Stockholders' Equity					
1,226	\$3,361,164	\$4,608,348	\$1,375,000	\$3,233,348	673,920	\$4.80	\$1.80	\$40.10	\$5,559,958	\$20,711,527	\$ —	\$27,027,969	143,400,000
1,586	3,949,467	3,529,402	885,000	2,644,402	673,920	3.92	1.80	36.66	2,880,967	21,532,653	515,599	24,703,850	127,700,000
5,659	2,850,346	3,505,236	1,050,000	2,455,236	673,920	3.64	1.70	34.53	3,190,428	21,140,096	1,929,701	23,272,504	123,300,000
5,456	1,699,882	3,629,853	1,000,000	2,629,853	673,920	3.90	1.60	32.59	3,284,855	20,334,453	2,442,545	21,962,932	121,600,000
1,572	1,594,627	2,342,472	480,000	1,862,472	673,920	2.76	1.60	30.29	3,026,636	20,105,940	3,380,502	20,411,351	123,100,000
9,289	1,551,849	2,611,313	800,000	1,811,313	673,920	2.69	1.60	29.12	2,772,358	16,684,704	1,200,000	19,627,151	124,500,000
1,725	1,500,946	2,335,664	787,000	1,548,664	673,920	2.30	1.60	28.04	2,538,648	15,361,414	—	16,894,110	102,700,000
9,572	1,678,275	3,004,006	960,000	2,044,006	677,220	3.02	1.30	27.32	3,438,544	13,298,913	180,000	18,500,970	86,600,000
9,424	1,421,641	2,311,556	650,000	1,661,556	677,920	2.45	1.00	25.60	3,179,295	13,204,764	—	17,354,763	92,600,000
1,889	1,378,718	897,332	212,400	684,932	67	1.00	1.00	24.15	2,516,334	13,704,308	573,199	16,371,127	90,400,000





GOVERNMENT  
EXHIBIT  
Hug. Dep.  
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In 1965 UEC produced and sold 5,409,815 tons of bituminous coal compared with 3,801,522 in 1964. Production during the first nine months of 1966 exceeded production for the comparable period in 1965 by 316,663 tons.

Earnings for 1965 declined from the prior year as a result of extraordinary expenses incurred in connection with closing the Mary Moore Mine (where the coal reserves were exhausted), moving heavy equipment to other operating properties and, at two of UEC's four other mines, developing new operating pits and moving from worked-out areas. In addition, in the Spring of 1965 record flood conditions on the Mississippi River curtailed sales and disrupted operations for approximately two months at one of UEC's principal mines. For the first nine months of 1966, however, net income was \$2,493,986 compared to \$1,524,908 for the first nine months of 1965.

In 1964 and 1965 UEC sold 73% of its production to electric utilities, 23% to industrial users and 4% to others, with two electric utilities accounting for approximately 38% of total sales. Approximately 63% of sales in 1965 were made under term contracts (almost all with electric utilities) which will expire at various dates from December 31, 1966 to December 31, 1970, and an additional 9% of 1965 sales were made under term contracts expiring on or before December 31, 1974. Substantially all sales to industrial users are under one-year contracts or on a spot basis except for two contracts, one for 275,000 tons per year expiring on May 31, 1970 and the other for 325,000 tons per year expiring on December 31, 1968.

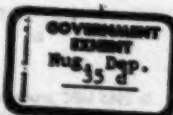
UEC competes intensively with other coal producers. In addition, atomic energy is becoming a competitive source of energy for electric utilities, but no prediction is made herein as to the long-range effect which atomic energy will have on coal utilization in the Midwest. General Dynamics is actively engaged in commercial development of atomic energy.

During the period from January 1960 to September 1966, the average price of bituminous coal sold by UEC declined from \$4.27 to \$4.10 per ton, with sales to electric utilities being made at slightly lower prices than to industrial users; substantially all of this reduction, however, has been offset by operating efficiencies and lower freight rates.

UEC operates four open pit or strip mines located in Illinois as follows: Fidelity Mine in Perry County, whose output is transported to market by rail and barge; Cuba Mine in Fulton County, which is strategically located to serve the Peoria market; and Buckheart Mine in Fulton County and Banner Mine in Fulton and Peoria Counties, which also serve the Peoria market and in addition are located close to the Illinois River, making possible low-cost transportation to the Chicago area. In addition, UEC has underground coal deposits in Illinois and strip coal and underground deposits near Hayden, in Routt County, Colorado.

UEC states that at December 31, 1965, it had approximately 84,600,000 tons of coal reserves in Illinois suitable for strip mining. Of this total, approximately 72,100,000 tons are dedicated to UEC's four existing mines which, at UEC's 1965 annual rate of production, have remaining lives ranging from 8 to 16 years. UEC also had approximately 30,800,000 tons of underground coal deposits in Illinois, and other miscellaneous reserves of 7,000,000 tons, but has no present plans to mine such coal.

In light of the limited life of UEC's existing strip mining reserves in Illinois and the unavailability of additional strip mining reserves in the Midwest, UEC has been engaged in an exploration program in Colorado and other western states to secure strip mining coal reserves which can be developed by utilizing UEC's strip mining machinery and equipment. As a result of such exploration program, in addition to the reserves described above UEC states that it has acquired in Colorado an estimated 12,500,000 tons of coal reserves suitable for strip mining, and an undetermined amount of underground coal reserves the extent of which has not been explored. UEC has no coal operations in Colorado and has no plans to commence operations there until increased demand for coal in that area makes development of such



reserves commercially feasible. Accordingly the future commercial content of the exploration program and the development of the Colorado reserves is a matter of speculation.

Approximately half of UEC's strip coal deposits and substantially all its underground coal deposits are leased; the balance of such reserves is owned in fee. At December 31, 1965, UEC had commitments of approximately \$1,900,000 for advance royalty payments on long-term leases and \$600,000 for future payments on contracts to purchase coal lands; approximately \$650,000 of the total commitments of \$2,500,000 was payable in 1966. At September 30, 1966, such commitments amounted to approximately \$1,600,000 for advance royalty payments and \$600,000 for future payments on contracts to purchase coal lands.

From time to time UEC has transactions in the ordinary course of business with Freeman Coal Mining Corporation, a wholly owned subsidiary of General Dynamics. In 1965 UEC sold approximately \$1,284,000 of coal through Freeman Coal and Freeman Coal sold approximately \$200,000 of coal through UEC. All such transactions have been on customary trade terms. In addition, UEC and Freeman Coal are supplying coal on a joint basis to certain customers.

UEC delivers a portion of its coal production by barge utilizing the facilities of three companies which are 50% owned by UEC.

A 30-month agreement with the United Mine Workers of America was reached in the Spring of 1966. Although the agreement will result in increased labor costs, UEC's term sales contracts contain escalation clauses so that the increased labor costs are not expected to have any material adverse effect upon UEC's earnings.

As set forth in its balance sheet as at September 30, 1966, UEC has issued 577,920 shares of Common Stock, of which 4,000 shares are held in treasury. Each share of Common Stock has the same rights and privileges; is entitled to one vote; participates equally in any dividends declared upon the Common Stock; and would participate equally in assets available for distribution to stockholders upon any liquidation, dissolution or winding-up. The Common Stock has no conversion or preemptive rights. The Transfer Agent for the Common Stock is The Chase Manhattan Bank (National Association).

Dividends have been paid on UEC Common Stock at the annual rate of \$1.00 in 1961, \$1.45 in 1962 and thereafter at the annual rate of \$1.20. In connection with its guaranty of the obligations of certain affiliates, UEC has agreed to maintain working capital of \$1,750,000 (at September 30, 1966, working capital was \$11,134,822).

The following table sets forth the market prices of the Common Stock of UEC on the New York Stock Exchange:

Year or Partial Ending	High	Low
1961	67 1/2	44 1/2
1962	64	41 1/2
1963	59	45 1/2
1964	55	44 1/2
1965	50 1/2	42 1/2
1966 (to September 30)	49 1/2	39 1/2

On September 30, 1966, 100 shares of UEC Common Stock were traded on the New York Stock Exchange at \$41 1/2 per share prior to the announcement of this tender offer. The last previous sale on the Exchange had taken place on September 22, 1966, when the closing price was \$42 1/2.

## General

GOVERNMENT  
SECURITY  
REG. NO. 35 e

General Dynamics may withdraw this invitation, at its option, at any time during the initial extended tender period, if a state of war has been declared by the United States, or if any trading moratorium or general suspension of trading on the New York Stock Exchange has been declared or if any legal action or proceeding shall have been instituted or threatened in any court or government agency against General Dynamics or UEC with regard to this tender offer.

*General Dynamics makes no recommendation that stockholders of UEC tender or refrain from tendering all or any of their shares, and no one has been authorized to make any such recommendation. Each stockholder must make his own decision as to whether to tender shares and, if so, how many shares to tender.*

Additional copies of this invitation for Tenders and the Form of Tender and Assignment and UEC's Annual Report for 1965 can be obtained from The Chase Manhattan Bank (National Association), or at the following offices of Georgetown & Co.:

52 Wall Street  
New York, N. Y. 10005  
Republic Building  
Cleveland, Ohio 44115  
617 Land Title Building  
Philadelphia, Pennsylvania 19102  
41 Sutter Street  
San Francisco, California 94104

208 South La Salle Street  
Chicago, Illinois 60604  
Penobscot Building  
Detroit, Michigan 48226  
140 Federal Street  
Boston, Massachusetts 02110  
650 South Spring Street  
Los Angeles, California 90014

Dated: October 5, 1966.

GENERAL DYNAMICS CORPORATION

71-g. 1791

135 f, Ia. 9/1/62, 1210-5



THE UNITED ELECTRIC COAL COMPANIES

BALANCE SHEET

December 31, 1965 and September 30, 1966

ASSETS

CURRENT ASSETS:

	December 31, 1965	September 30, 1966 (Unaudited)
Cash	\$ 1,766,245	\$ 1,321,113
Bank certificates of deposit	3,675,000	5,975,000
Accounts receivable (less allowances for possible losses—1965, \$50,000; 1966, \$50,800)	2,394,400	2,617,185
Notes receivable	—	1,000,000
Inventory:		
Coal on hand, at lower of average cost or market	102,025	63,710
Drilling, blasting, and stripping costs of coal in process of being mined, at average cost	391,507	470,001
Repair parts, operating supplies, etc., at average cost or lower (less allowances for obsolescence—1965, \$100,000; 1966, \$118,000)	1,802,138	1,794,990
Total inventory	2,295,670	2,328,701
Prepaid expenses	307,509	266,486
Total current assets	10,440,824	13,508,485

INVESTMENTS (Note 1)

	733,383	733,383
PROPERTY, PLANT AND EQUIPMENT:		
Buildings, machinery, etc., at cost (less accumulated depreciation—1965, \$25,367,105; 1966, \$27,381,920)	10,699,788	9,051,940
Coal lands and rights, etc., at cost (less accumulated depletion—1965, \$6,775,311; 1966, \$7,384,798)	7,344,738	7,064,934
Advances making royalties—net	2,232,670	2,455,356
	20,277,196	18,794,233
Total	\$31,473,405	\$33,056,602

## THE UNITED ELECTRIC COAL COMPANIES

## BALANCE SHEET

December 31, 1965 and September 30, 1966

## LIABILITIES

	December 31, 1965	September 30, 1966 (Unaudited)
<b>CURRENT LIABILITIES:</b>		
Accounts payable and accrued expenses	\$ 1,028,473	\$ 781,012
Accrued salaries and wages, etc.	487,698	483,397
Federal income taxes	554,225	805,990
Dividend payable	—	303,264
Total current liabilities	<u>2,071,396</u>	<u>2,373,663</u>
<b>STOCKHOLDERS' EQUITY:</b>		
Common stock—authorized, 750,000 shares of \$5 per value each; issued, 677,920 shares (including 306,000 shares at previous aggregate stated value of \$4,657,318)	6,516,918	6,516,918
Capital surplus	1,359,691	1,359,691
Earned surplus	<u>21,619,625</u>	<u>22,900,335</u>
	29,496,234	30,777,164
Deduct—cost of 4,000 common shares held in treasury	<u>94,225</u>	<u>94,225</u>
	29,402,009	30,682,939
<b>Total</b>	<u>\$31,473,405</u>	<u>\$33,056,602</u>

## NOTES:

1. **INVESTMENTS:** Included in investments is the cost, \$736,886, of the Company's investment in capital stocks of affiliates engaged in large operations. The Company's equity in the combined net assets of these affiliates exceeds its investments therein. These large affiliates had loans of \$2,943,402 at December 31, 1965, and \$2,348,886 at September 30, 1966, and the owners of these affiliates in effect guarantee that the repayment will be sufficient to repay the installments of these loans. In connection with such guarantee, the Company has also agreed to maintain working capital of \$1,750,000.

2. **COMMITMENTS:** At December 31, 1965, the Company had commitments of approximately \$1,500,000 for advance royalty payments on long-term coal leases and \$600,000 for future payments on option contracts to purchase coal lands, of which approximately \$450,000 is payable in the year ending December 31, 1966. At September 30, 1966, such commitments amounted to approximately \$1,600,000 for advance royalty payments and \$600,000 for future payments on contracts to purchase coal lands.

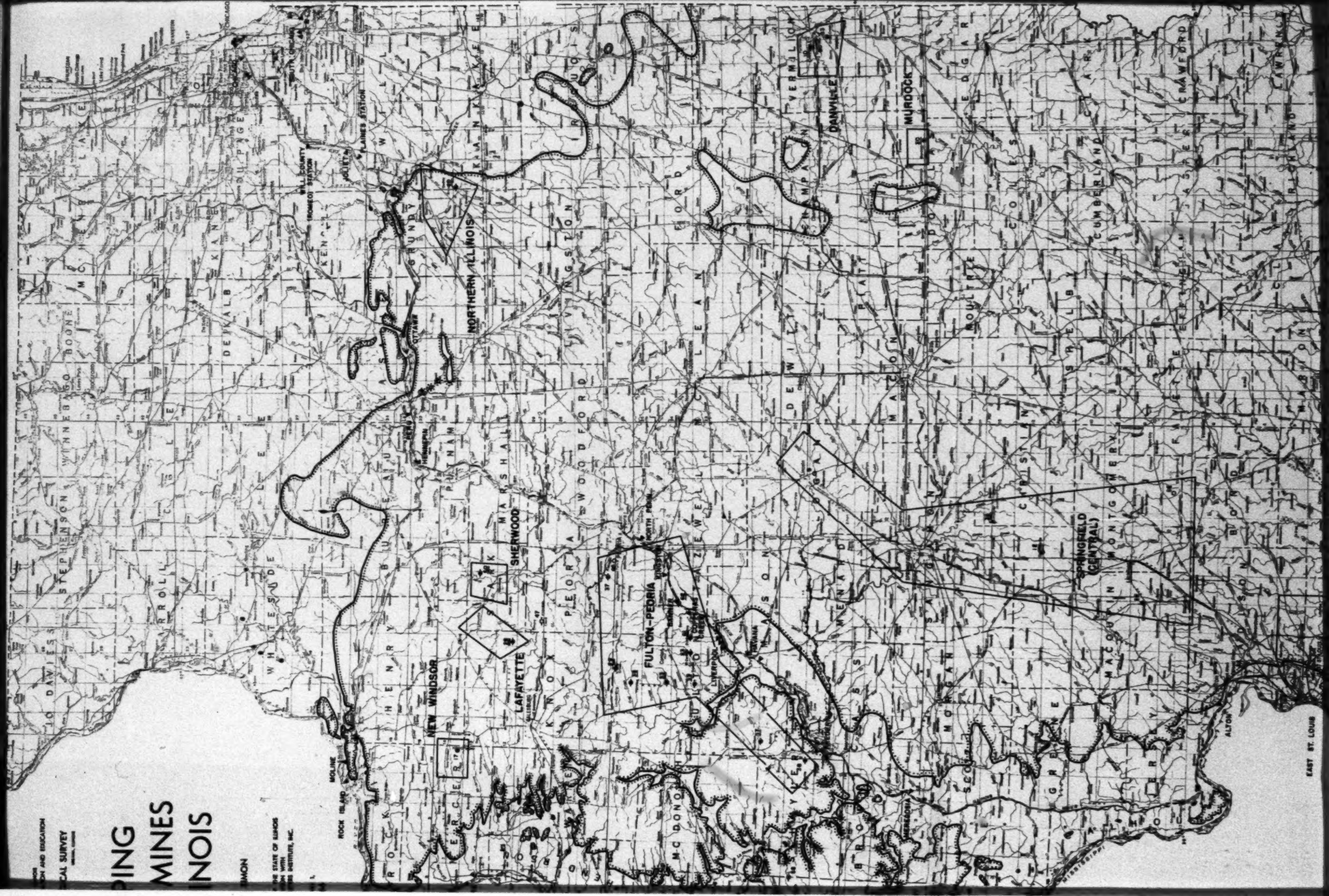


MINES AND RESEARCH  
LOCAL SURVEY

# MINING MINES NOIS

MINON

THE STATE OF ILLINOIS  
DEPARTMENT OF MINES AND GEOLOGY  
GEOLOGICAL SURVEY



EAST ST. LOUIS





Scale 1:50,000  
Feet  
Meters  
Kilometers  
Miles



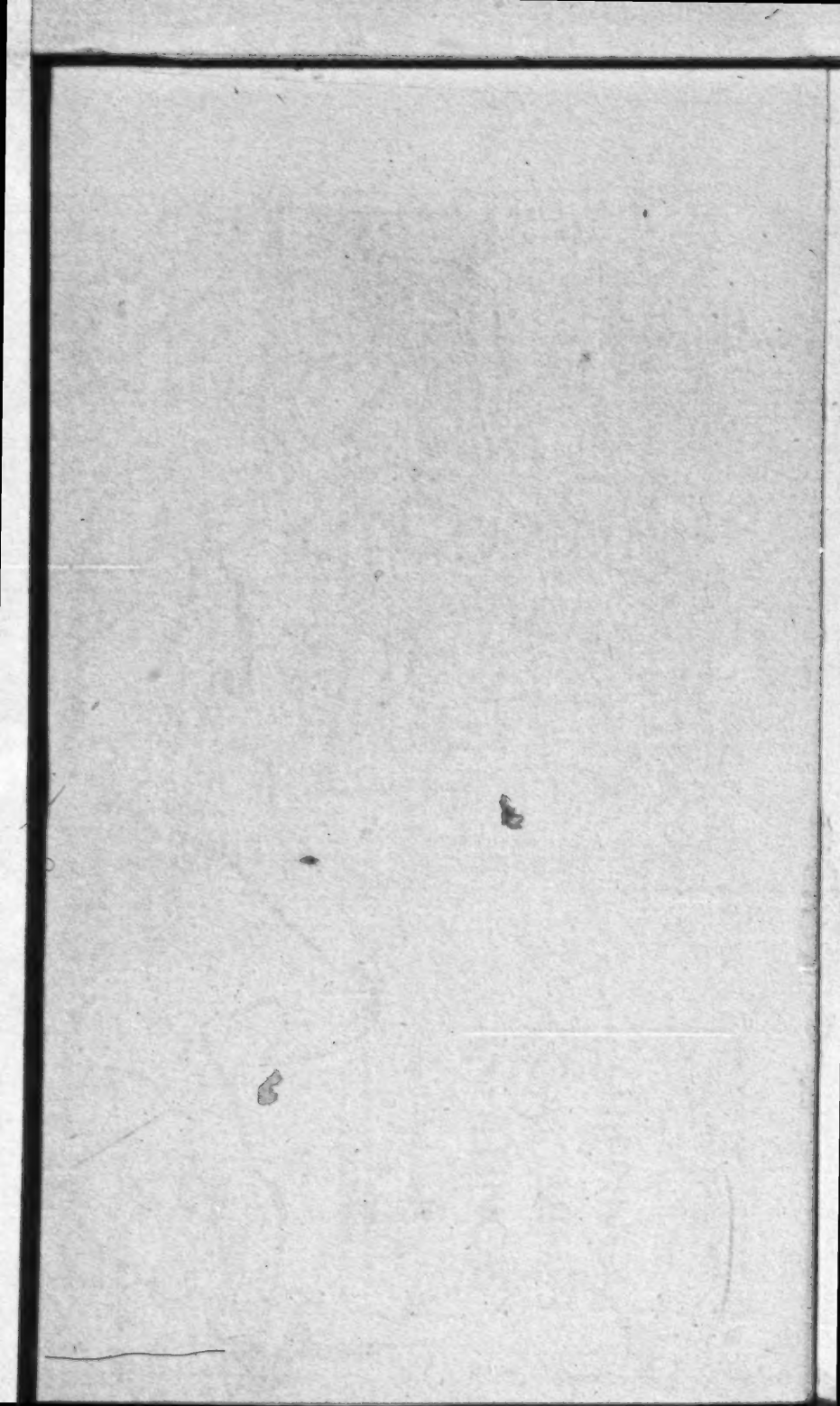
Scale 1:50,000  
Feet  
Meters  
Kilometers  
Miles







1994-95 Coal Inventory and





NUG. DEP. EXHIBIT 39-A

bcc: Mr. J. M. Morris (1)

December 11, 1964

Mr. Frank Nugent, President  
Freeman Coal Mining Corporation  
300 W. Washington St.  
Chicago, Illinois 60606

Dear Frank:

Enclosed please find four copies of the tabulation you requested of the Midwestern coal consumption by utility plants for the year 1963.

We trust that this is the information you wanted and if there is anything further we can do in this connection, please advise.

Best regards,

/s/ T. J. Tarzy  
T. J. TARZY

TJT:sjs

cc: Mr. B. R. Gebhart

\* Denotes use of additional coal from sources other than Illinois, Indiana, & West Kentucky.

All tonnage figures shown are in thousands.

Total Tons All  
MIDWESTERN Coal

Name of Utility

GOVERNMENT  
EMERGENCY  
Nug. Dep.  
39-B

Tons of  
ILLINOIS Coal  
Used

Tons of  
INDIANA Coal  
Used

Tons of  
WEST KENTUCKY Coal  
Used

(Plants using under 50,000 tons per year not included)

15,870*	TVA	3,470	-	12,420
11,350	Commonwealth Edison	10,450	700	200
4,390	Union Electric	4,390	-	-
4,060	Indiana & Kentucky Electric Corp	-	1,680	2,380
3,320	Public Service of Indiana	-	1,560	1,760
3,150	Electric Energy	1,400	-	1,750
2,660*	Wisconsin Electric Power	1,400	-	1,260
2,230	Illinois Power	2,000	30	200
2,170*	Indiana & Michigan Electric	-	1,570	600
2,110*	Northern States Power	1,910	-	200
1,600	Central Illinois Public Service	1,600	-	-
1,580	Northern Indiana Public Service	200	1,380	-
1,560	Indianapolis Power & Light	-	1,560	-
1,460*	Cincinnati Gas & Electric	-	-	1,460
1,410	Louisville Gas & Electric	-	-	1,410
1,290*	Consumers Power	80	80	1,130
1,160	Memphis Tenn. Light, Gas & Water	-	-	1,160
980	Central Illinois Light	980	-	-
980	Wisconsin Power & Light	620	-	360
900*	Tampa Electric - F. J. Gannon	-	-	900
550*	Kentucky Utilities	-	-	550
480	Dairyland Power Co-Op.	420	-	60
470	Interstate Power	460	10	-
450	Southern Indiana Gas & Electric	-	430	20
440*	Wisconsin Public Service	410	-	-
400*	Iowa Electric Light & Power	400	-	-
400*	Georgia Power	-	-	400
300	Iowa-Illinois Gas & Electric	300	-	-
280	Central Electric Power-Chambers	280	-	-
230	Springfield Ill. Water Light & Power	230	-	-
190	Central Illinois Electric & Gas	140	50	-
160	Madison Gas & Electric	120	-	40
130	Richmond Indiana Electric & Power	-	130	-
120	Lake Superior District Power-Ashland	120	-	-
100				100

2,230	Illinois Power	2,000	30	200
2,170*	Indiana & Michigan Electric	-	1,570	600
2,110*	Northern States Power	1,910	-	200
1,600	Central Illinois Public Service	1,600	-	-
1,580	Northern Indiana Public Service	200	1,380	-
1,560	Indianapolis Power & Light	-	1,560	-
1,460*	Cincinnati Gas & Electric	-	-	1,460
1,410	Louisville Gas & Electric	-	-	1,410
1,290*	Consumers Power	80	80	1,130
1,160	Memphis Tenn. Light, Gas & Water	-	-	1,160
980	Central Illinois Light	980	-	-
980	Wisconsin Power & Light	620	-	360
900*	Tampa Electric - P. J. Gannon	-	-	900
550*	Kentucky Utilities	-	-	550
480	Dairyland Power Co-Op.	420	-	60
470	Interstate Power	460	10	-
450	Southern Indiana Gas & Electric	-	430	20
410*	Wisconsin Public Service	410	-	-
400*	Iowa Electric Light & Power	400	-	-
400*	Georgia Power	-	-	400
300	Iowa-Illinois Gas & Electric	300	-	-
280	Central Electric Power-Chambers	280	-	-
230	Springfield Ill. Water Light & Power	230	-	-
190	Central Illinois Electric & Gas	140	50	-
160	Madison Gas & Electric	120	-	40
130	Richmond Indiana Electric & Power	-	130	-
120	Lake Superior District Power-Ashland	120	-	-
100	Owensboro, Ky. Municipal Utility	-	-	100
80	Manitowoc Wisc. Public Utility	80	-	-
80	Muscatine Iowa Munic. Elec. Plant	70	-	-
70	N. E. Missouri Electric Power	70	-	-
60	Marshfield Wisc. Elec. & Water	60	-	-
60	Crawfordsville Ind. Elec. Light & Pr.	-	60	-
50*	Iowa Public Service	50	-	-
50	Mt. Carmel Public Utility	-	50	-
50	Logansport, Indiana, City of	-	-	50
50	TOTALS	11,690	9,290	28,420
59,100	Total Field Production	51,700	15,100	35,700
	Tons Used by Utilities	31,690	9,290	28,420
	Percentage Utility Use	61.3%	61.5%	79.6%

102,500  
40,407  
1733





## NUG. DEP. EXHIBIT 49

BOARD OF DIRECTORS MEETING  
HELD OCTOBER 28, 1960

• • • • •  
Upon motion duly made by Mr. Nugent, and duly seconded by Mr. Falkoff, it was unanimously

RESOLVED, that the proper officers of this Company, for and on its behalf, be and they hereby are authorized and directed to place a purchase order for a 70 cubic yard stripping shovel costing approximately \$2,800,000.00; and

FURTHER RESOLVED, that said order be subject to cancellation within 30 days from this date by payment of such expenditures as the manufacturer may have made during that time and which cannot be recouped by him.

The Chairman stated because of conversations in the past in regard to possible consolidation with another coal company in this area it might be well to give some consideration to the subject.

Thereupon, on motion duly made by Mr. Gebhart, and duly seconded by Mr. Thorson, Messrs. Nugent, Falkoff and Morris not voting, it was

RESOLVED, that a committee composed of Messrs. Nugent as Chairman, Falkoff and Morris be and they hereby are appointed to serve at the pleasure of this Board to investigate and report to this Board concerning such consolidation.

• • • • •



## NUGENT EXHIBIT A

THE UNITED ELECTRIC COAL COMPANIES  
307 North Michigan Avenue

Chicago 1, Illinois

FRANK F. KOLE

PRESIDENT

October 9, 1956

Mr. Henry Crown  
Chairman of the Board  
Material Service Corporation  
300 West Washington Street  
Chicago 6, Illinois

Dear Henry:

Herewith a comparison of ourselves and Traux-Traer based primarily on tons produced in each locality per annum showing what we would get in a merger and what we might be giving. The earnings by United and Truax per ton from the coal in each area should be the same over a period of time, as the overburden in each area is about the same on the average. Some years overburden will be much lower at one mine than another, resulting in lower stripping cost and lower blasting cost, but it will average out.

At present in Fulton County we are producing the same tons as Truax, but our potential reserves are 60 per cent greater, and ultimately this will be represented in production and sales. We are now building a new, larger wheel at our Cuba mine which will increase our capacity there 500,000 tons a year, and we are also considering the acquisition of a mine in the Banner area on the Illinois River just below Peoria. This mine is now producing 200,000 tons a year, and we might increase this to 700,000 tons. If we did this, our total capacity in Fulton County would be 3,300,000 tons, as compared with Truax's present 2,100,000. In Southern Illinois

Truax has much larger reserves than we do, but I do not think this is a particularly good place to have reserves. Our Danville and Buffalo Creek mines are very profitable mines, as profitable as or more profitable than similar mines in Fulton County. The Truax mines in West Virginia and in North Dakota are out of our territory, and I do not know anything about them.

More of the benefits would come from the Truax properties than from our own. At present the tonnage from the Little Sister properties goes to the Little Sister washer and then goes by Burlington Railroad to the Truax dock. We would take this to Buckheart and then down our railroad. At the Shakerag mine of Truax, the combined company might save money by putting in a washer to prepare only two sizes of coal, 2 x 4 and 2 x 0. The various other sizes could be produced at the Fidelity washer. This would make for a cheap and economical-to-run washer at the Shakerag properties.

For a consolidated company, the West Virginia tonnage does not have as much purpose as in the present Truax company, as in a consolidated company it would be only a fifth of the total output, instead of a third, and if certain expansion that we are contemplating were put through, it would be only a sixth. Under these circumstances, it would be only the tail of the dog, with its own mining and selling problems that would be completely different from the problems of the other 80 per cent. I doubt whether under these circumstances it would get the same progressive, forward-looking attention that the other 80 per cent would, and whatever it did get might detract from the attention that should be given to the properties in the Middle West. With the present move toward consolidations in the East and toward acquisition of properties, it might be that this property could be sold and the funds distributed to the present Truax stockholders, or they might be given preferred stock.

If the Eastern properties were taken out, our relative productions would be as follows:

	United's Production	Truax's Production	Excess of Truax's Production Over United's
Fulton County Railroad—Profits in Tons of Coal Equivalent	2,100,000	2,100,000	—
Danville	300,000	—	(300,000)
Buffalo Creek	300,000	—	(300,000)
Total	3,000,000	2,100,000	(900,000)
Southern Illinois	1,500,000	2,500,000	1,000,000
Total	4,500,000	4,600,000	100,000
North Dakota	—	1,500,000	1,500,000
Total	4,500,000	6,100,000	1,600,000

The earnings from the 6,100,000 would not be far different from the earnings from the 4,500,000.

We are in a position now to go ahead with some expansion, and if we did so, we would be sharing the benefits of this with Truax. On the other hand, they would be paying their share of it. We have the possibility now of earning \$3.50 or \$4.00 a share from our present properties and of opening new mines which would increase these earnings. I just want to be sure that in a merger our earnings per share per annum would be increased.

Very sincerely yours,

/s/ Frank F. Kolbe  
FRANK F. KOLBE  
President

GOVERNMENT  
EXHIBIT  
Fed. Dep.  
5

The United Electric Coal Corporation  
Computation of Provision for Federal Income Taxes  
Month of October, 1966 and 10 Months ended October 31, 1966

Profit before Income Taxes (Year to Date)			4,144,190
Less:			
Excess of percentage depletion over depletion recorded per books			<u>1,517,975</u>
Taxable Income (Year to Date)			<u>2,727,215</u>
Income Tax Calculation	2,700,371 @ 45%	1,295,274	
	29,641 @ 25%	7,410	
		<u>1,302,684</u>	
Surtax Credit		(6,500)	1,297,184
Investment Credit			<u>(12,823)</u>
			1,284,361
Additional provision			<u>71,236</u>
Provision for Income Taxes (Year to Date)			1,355,597
Less to Date Tax Provision (Last Month)			<u>1,160,000</u>
Provision for Income Taxes (This Month)			<u>205,597</u>

1801

## The United Electric Coal Companies



INTERCOMPANY SALES

OCTOBER

YEAR TO DATE

1966

OCTOBER 31, 1966

FREEMAN

142,196.27

1,194,162.93

MATERIAL SERVICE

41,300.10

276,204.00

183,562.37

2,071,626.43

The company is in a position now to get out of the coal business and if we did so we would be sharing the benefits of the coal business with Trunk. On the other hand, if we stay in the coal business we will be sharing the losses of the coal business with Trunk. We want to know what you think of this proposal. We want to know what you think of the proposal of opening new mines which will be owned and operated by Trunk. We want to know what you think of the proposal of opening new mines which will be owned and operated by Trunk. We want to know what you think of the proposal of opening new mines which will be owned and operated by Trunk.

Very sincerely yours,

Frank F. Koller  
 Frank F. Koller  
 President

1 70



THE UNITED ELECTRIC COAL COMPANIES  
ACTUAL VS. BUDGET  
YEAR TO DATE OCTOBER 31, 1966

	<u>Actual</u>	<u>% of Sales</u>	<u>Budget</u>	<u>% of Sales</u>
Net Sales	<u>19,622,000</u>	<u>100.0</u>	<u>17,671,000</u>	<u>100.0</u>
Operating Profit	<u>4,028,000</u>	<u>20.5</u>	<u>2,905,000</u>	<u>16.4</u>
Other Income (Expense)	<u>116,000</u>	<u>.6</u>	<u>100,000</u>	<u>.6</u>
Provision for Contingency	<u>-</u>	<u>-</u>	<u>100,000</u>	<u>1.7</u>
Profit before Income Taxes	<u>4,144,000</u>	<u>21.1</u>	<u>2,705,000</u>	<u>15.3</u>
Net Income	<u>2,819,000</u>	<u>14.5</u>	<u>1,966,500</u>	<u>11.1</u>

SALES

Sales were up because of more business and higher realization than anticipated in the budget.

PROFIT

Profit was greater because of higher sales as per above, and costs incurred have generally been lower than anticipated.

Included in net income is \$13,420.06 of investment credit.

BALANCE SHEET

The Company had commitments of approximately \$2,580,000 for payments of advance royalties and on option contracts to purchase coal lands.

Barge affiliates of the Company had loans of \$2,548,606 as of September 30, 1966, and the owners of those affiliates in effect guarantee that the revenues will be sufficient to repay the installments of these loans.

As of October 31, 1966, the Company had a reserve for doubtful accounts of \$50,000.

Included in cash as of October 31, 1966, are \$5,475,000 of Certificates of Deposit.

Included in intercompany receivables are promissory notes in the amount of \$2,000,000 from General Dynamics Corporation and accrued interest thereon of \$6,333.

**THE UNITED ELECTRIC COAL COMPANIES**  
**ACTUAL VS. BUDGET**  
**OCTOBER, 1966**

	<u>Actual</u>	<u>% of Sales</u>	<u>Budget</u>	<u>% of Sales</u>
Net Sales	<u>2,042,000</u>	<u>100.0</u>	<u>1,905,000</u>	<u>100.0</u>
Operating Profit	<u>510,000</u>	<u>25.0</u>	<u>340,000</u>	<u>17.8</u>
Other Income (Expense)	<u>40,000</u>	<u>1.9</u>	<u>10,000</u>	<u>.5</u>
Provision for Contingency	<u>-</u>	<u>-</u>	<u>15,000</u>	<u>.8</u>
Profit before Income Taxes	<u>550,000</u>	<u>26.9</u>	<u>315,000</u>	<u>16.5</u>
Net Income	<u>345,000</u>	<u>16.9</u>	<u>229,500</u>	<u>12.0</u>

SALESPROFIT

The increase in net income resulted primarily from higher realization and lower costs than anticipated at Fidelity and Banner mines.

BALANCE SHEET

THE UNITED ELECTRIC COAL COMPANIES  
CASH FORECAST  
NOVEMBER, 1966

Balance October 31, 1966	7,264,333
November, 1966 Surplus (deficit)	(6,200,000)
Balance November 30, 1966	1,064,333
December, 1966 Surplus (deficit)	400,000
Balance December 31, 1966	1,464,333
January, 1967 Surplus (deficit)	300,000
Balance January 31, 1967	1,764,333
February, 1967 Surplus (deficit)	330,000
Balance February 28, 1967	2,114,333
March, 1967 Surplus (deficit)	400,000
Balance March 31, 1967	2,514,333
3 months ended June 30, 1967 Surplus (deficit)	900,000
Balance June 30, 1967	3,414,333
3 months ended September 30, 1967 Surplus (deficit)	900,000
Balance September 30, 1967	4,314,333

**THE UNITED NUCLEAR COAL COMPANY**  
**MONTHLY STATEMENT OF SALES AND PROFIT**  
**AS OF NOVEMBER 15, 1966**

	As of November 15, 1966			
	<u>Actual</u> <u>10 Months</u> <u>Ended Oct. 31</u>	<u>November</u>	<u>Estimated</u> <u>December</u>	<u>Year Ended</u> <u>December 31</u>
Sales	19,622,320	2,000,000	1,877,680	21,500,000
Protax Profit	4,144,190	300,000	305,810	4,750,000
Tax Provision (before investment credit)	1,318,420	70,000	75,000	1,463,420
Investment Credit	13,420			13,420
Net Income	2,825,770	230,000	230,810	3,300,000

## INCOME STATEMENT

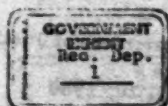
 THE UNITED ELECTRIC  
 COAL COMPANIES  
 DATE OCTOBER 1, 1966  
 PERIOD 1966

LINE	MONTH	AMOUNT
1		
2	NET SALES	
3	COST OF SALES	2 000 560
4	OPERATING PROFIT (LOSS)	1 530 508
5	OTHER INCOME (EXPENSE)	510 352
6	EARNINGS FROM UNCONSOLIDATED SUBSIDIARIES	
7	INTEREST INCOME	
8	INTEREST EXPENSE	27 877
9	INTERCOMPANY/INTERDIVISION INCOME (EXPENSE)	
10	MISCELLANEOUS NET	5 000
11		6 825
12	PRETAX PROFIT (LOSS)	
13	PROVISION FOR INCOME TAXES	550 208
14	NET INCOME (LOSS)	205 000
15		255 208
16	SALES - INTERCOMPANY (MS and its subsidiaries)	
17	INTERDIVISION	183 562
18		
19	INVESTMENT CREDIT	
20		
21		
22	YEAR TO DATE	
23	NET SALES	
24	COST OF SALES	19 622 320
25	OPERATING PROFIT (LOSS)	15 996 535
26	OTHER INCOME (EXPENSE)	8 027 735
27	EARNINGS FROM UNCONSOLIDATED SUBSIDIARIES	
28	INTEREST INCOME	
29	INTEREST EXPENSE	215 262
30	INTERCOMPANY/INTERDIVISION INCOME (EXPENSE)	
31	MISCELLANEOUS NET	6 333
32		(105 190)
33	PRETAX PROFIT (LOSS)	
34	PROVISION FOR INCOME TAXES	8 746 790
35	NET INCOME (LOSS)	1 305 000
36		2 530 190
37	SALES - INTERCOMPANY (MS and its subsidiaries)	
38	INTERDIVISION	2 021 627
39		
40	INVESTMENT CREDIT	
41		13 820
42	SALES - RENEGOTIABLE	
43	NONRENegotiable	
44	TOTAL (LINE 25)	19 622 320
45		19 622 320
46	STATISTICAL DATA	
47	NET SALES (LINE 25)	
48	LESS: SUPPORT DIVISIONS SALES	19 62 320
49	DIVISION SALES BASE	19 622 320
50		
51	DEPRECIATION, AMORTIZATION, ETC.	2 939 035
52	DEPLETION IN EXCESS OF COST	1 833 978
53	DIVIDENDS RECEIVED - FROM SUBSIDIARIES	
54	OTHERS	50
55		
56		

 FROM THE United Electric  
 Coal Companies







## KEYSTONE STEEL &amp; WIRE COMPANY

PEORIA - ILLINOIS - 61607

R. A. REDARD  
Vice President, Purchasing  
G. R. BOWEN  
Purchasing Agent

April 26, 1968

Department of Justice  
United States Courthouse  
Room 2634  
Chicago, Illinois 60604

Gentlemen:

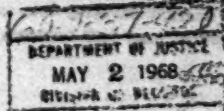
Re: United States v. General Dynamics  
Corporation et al., Civil Action  
No. 67 C 1632 (N.D. Ill.)

In response to your letter of April 15, we have accumulated the following data for you. Annual coal purchases in each of the years 1964 through 1967 in total tons and dollar value are as follows:

	<u>Truax-Traer</u>	<u>United Electric</u>	<u>Republic</u>	<u>Peabody</u>
1964				
Tonnage	80901	47529	23081	6972
\$ Value	\$353,993.72	\$201,638.35	\$132,801.62	\$31,219.16
1965				
Tonnage	81337	46512	29430	6885
\$ Value	362,567.90	207,523.61	134,250.11	30,972.57
1966				
Tonnage	76316	44371	20703	7534
\$ Value	343,079.74	204,316.73	199,816.60	40,144.04
1967				
Tonnage	79392	52169	28396	13338
\$ Value	349,105.92	245,725.43	130,490.98	58,007.23

Some of the above suppliers maintain more than one mine, and their billing does not reflect from which of these mines the shipment originated. All of the mines supplying our plant are located within a 25 mile radius of

*acknowledged  
5-22-68*



STEEL AND WIRE PRODUCTS FOR THE FARM AND HOME — SPECIAL ANALYSIS HERE FOR INDUSTRY



Department of Justice

Page 2

April 26, 1968

Peoria. The type of coal we use, namely No. 5 and No. 6 Seam, precludes shipment from any other area.

Coal is purchased by our Peoria facility as a fuel to generate steam for our Power Plant. We purchase stoker screening type coal; it is used by equipment described as follows: 1 Erie City boiler with a Detroit stoker; 3 Combustion Engineering with Combustion stokers. Three stokers are overthrow spreader type and one is an underthrow spreader design. We are equipped to burn gas or oil, however coal is used as a more efficient, economical, fuel.

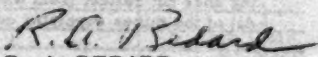
Our Peoria plant does not consume any other energy fuel for the same purpose for which coal is required.

We do consume other types of energy fuel such as gas and fuel oil for our Open Hearth furnaces, for many reheating furnaces, and for heat treating devices throughout our plant. Coal could not be used as a substitute for any of these purposes. A 60% - 40% gas-oil mixture is used in our Open Hearth furnaces. This mixture produces the most efficient, desirable flame for melt-down purposes. In all other locations we consume gas; it is the most efficient fuel available in each instance. We are equipped to substitute oil in each of these locations during the winter months when the local utility interrupts our service because of severe weather conditions.

We have no charts, surveys, or memoranda to substantiate the above information; however, any of the facts stated above may be verified by our technicians or by a visit to our plant. We have indicated our reasons for not converting to other fuel sources.

We hope this information will materially assist you.

Very truly yours,



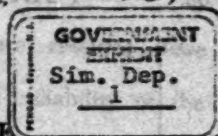
R. A. REDARD

VICE PRESIDENT, PURCHASING

RAR:jmh

## AN EVALUATION OF ILLINOIS COAL RESERVE ESTIMATE

J. A. SIMON, *Principal Geologist* and W. H. SMITH, *Geologist*  
*Illinois State Geological Survey*  
*Urbana, Illinois 61801*



### INTRODUCTION

Illinois has the largest total bituminous coal reserves and the largest strippable bituminous coal reserves of any state in the Union (figs. 1 and 2). A large percentage of these reserves are characterized as relatively thick and flat-lying coal seams. The coal-bearing sequence of rocks underlies about two-thirds (36,806 square miles) of the state and includes more than 50 coal seams, about 20 of which have been commercially mined at least locally. Most production has come from six to eight coal seams, and 85 to 90 percent of the total production has come from the Herrin (No. 6) and Harrisburg-Springfield (No. 5) Coals.

This report has two primary purposes: (1) to review the status of coal reserve estimates for Illinois, including those for both total reserves and strippable reserves and (2) to offer some comments on the significance and meaning of coal reserve estimates.

It is not necessary here to define most of the terms that will be used

in this report. A few, however,—coal resources, coal reserves, minable coal reserves, and strippable coal reserves—are frequently used interchangeably even though they are not synonymous, and their common usage and use in this report should be clearly understood.

Coal resources are all coal that occurs in the ground in any designated area without regard to thickness or minability. The only limitation is that the material being considered meets a suitable definition of coal. In this report, we are not concerned directly with coal resources except to note that coal resources in Illinois are much larger than coal reserves, as defined below, and that quantities of coal resources not now classified as reserves will be so classified in the future.

Coal reserves are that portion of coal resources, usually measured in tons, that are commonly limited by minimum thickness, often by maximum depth, and occasionally by other factors.

Minable coal reserves normally are coal reserves that can be re-

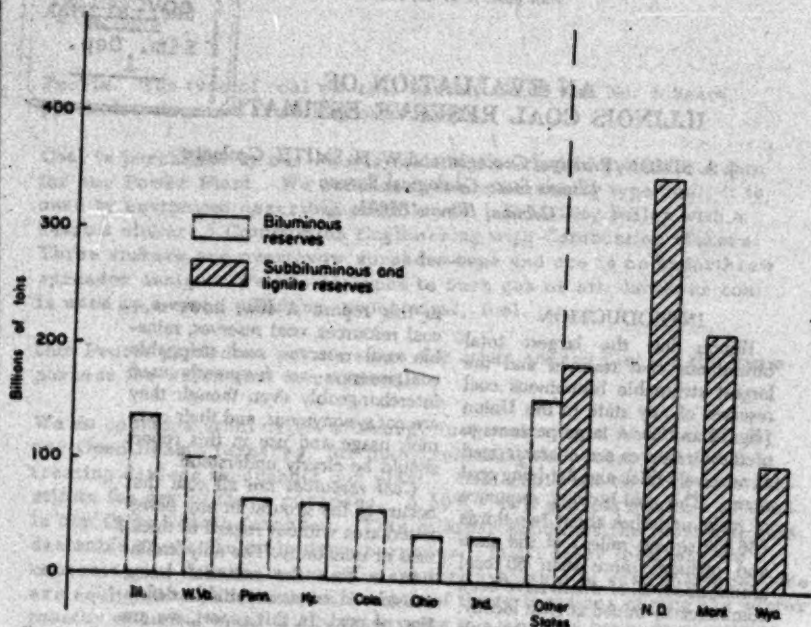


Fig. 1 — Estimated total remaining coal reserves of the United States, Jan. 1, 1967. Data from Paul Averitt, U. S. Geological Survey, personal communication, 1968.

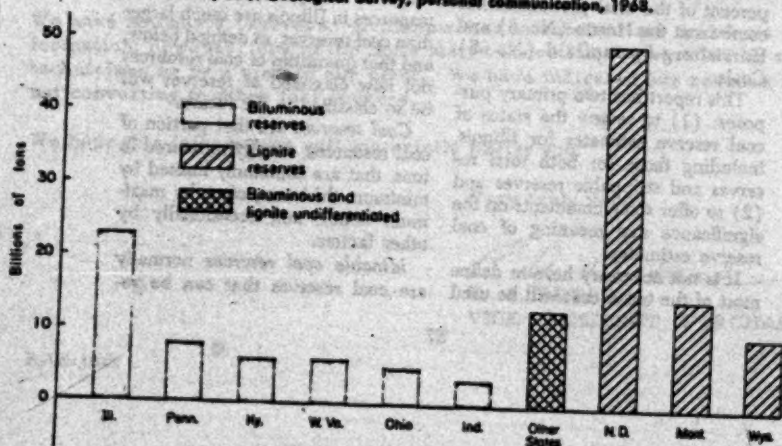


Fig. 2 — Estimated original reserves of strippable coal in the United States. Data from Averitt (1960, 1968).



covered by existing techniques, but most published studies have specifically considered neither technology nor the economics of mining, which are often merely implied in determining reserves. Generally, so-called minable coal reserves determinations have been based solely on presence of coal of a predetermined minimum or greater thickness and (in some cases) a maximum depth. Thus as generally reported, the terms *coal reserves* and *minable coal reserves* are synonymous, or nearly so. The desirability of distinguishing between *coal reserves* and technologically and economically *minable coal reserves* is obvious, but the fact that this differentiation has not generally been made in regional reserves studies should be well understood.

*Strippable coal reserves* carries the same implications of technologic and economic producibility as *minable coal reserves*, but in common practice they have been defined only by minimum thickness and either depth of overburden or stripping ratio for large areas ranging in size from counties up to a whole state.

Certain information is needed in studies of coal reserves of a large area. Some of the data are usually included in reserves studies, but other data are generally ignored. This report discusses both. The data usually given in reports include the following (as defined in each study):

- a) Estimate of total coal in the ground by seam

- b) Area where reserves were estimated
  - c) Degree of reliability of the estimates
  - d) Thickness categories for the estimates down to a minimum thickness considered
  - e) Thickness of overburden, or stripping ratio, for strip coal
- Not included in most such studies are:
- a) Quality (except broad rank categories)
  - b) Depth
  - c) Mining conditions
  - d) Economics
  - e) Land availability
  - f) Regulations and controls

#### COAL RESERVES OF ILLINOIS

The great need for coal reserves data in the United States was widely recognized after the turn of this century. In 1908, F. W. DeWolf, then Assistant State Geologist of Illinois, estimated about 137 billion tons of original coal reserves for Illinois.

Since that first state-wide summary of reserves, several additional authoritative estimates have been made (table 1). All but one exceeded DeWolf's estimate. The lowest estimate shown in table 1 included a number of factors not considered in any of the other estimates and generally excluded large areas where very little reliable data existed.

A series of detailed studies, including reserves estimates, was made for the various mining districts of the state by several authors

TABLE 1—PRINCIPAL ESTIMATES OF ILLINOIS COAL RESERVES

Source	Date	Billions of tons in the ground	Minimum Thickness (in.)
DeWolf	1908	137.0	36
Campbell and Parker	1909	240.0	?
Bement	1910	201.5	12
Campbell	1913	201.5	14
Bement	1929	201.4	36
Averitt and Berryhill	1950	165.6	?
*Ford, Bacon, and Davis	1951	49.6	{ 28 (underground) 12 (strippable)
Cady	1952	137.3	28
Simon and Smith	1968	140.0	{ 28 (underground) 18 (strippable)

\*Minability factors considered in addition to presence of coal.

between 1915 and 1925. These were published as a series of Cooperative Mining Investigations Bulletins (see Illinois Geological Survey List of Publications). G. H. Cady (1946), in an unpublished manuscript, tabulated the reserve estimates from these earlier studies, modified the totals where appropriate, and added additional information not included in the earlier studies. This compilation was the basis for the reserves data published by Averitt and Berryhill (1950).

In the early 1950's the Illinois State Geological Survey undertook another study of coal reserves of the state. This report (Cady et al., 1952) is the most comprehensive study yet made for Illinois. It utilized a very extensive file of drill hole logs and mine notes that the Survey had accumulated over a period of nearly 50 years. Cady's report has been the basis for most later coal reserves estimates for

Illinois, such as that of Averitt (1960). It is interesting to note that the total remaining reserves in the 1952 study were nearly identical to the rough original reserves estimates DeWolf made many years earlier.

During the past 12 years, a series of detailed studies estimating strip-pable coal reserves (defined in the reports) has been made in Illinois. Most of the potential areas of strippable reserves in Illinois have now been studied. Seven parts of the nine-part series have been published (Smith 1957, 1958, 1961, 1968, Smith and Berggren, 1963, Reinertsen, 1964, Searight and Smith, in preparation). Two unmapped areas are currently being examined to complete the series.

Data collected in the strippable coal reserves studies and detailed reports on several counties published since the Cady report have resulted in modification of the esti-

## COAL RESERVE ESTIMATES

61

mated remaining reserves. The remaining total coal reserves are estimated to be 140 billion tons (fig.

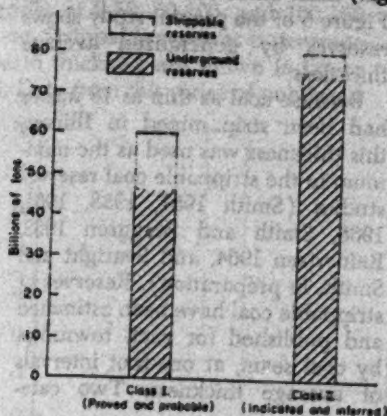


Fig. 3—Coal reserves of Illinois, 1968 (140 billion tons). Data from Cady et al. (1952), Smith (1957, 1958, 1961, 1968), Smith and Berggren (1963), Reinertsen (1964), and Searight and Smith (in preparation).

3). This amount, as defined in Cady's report and the strippable studies, was arrived at by reducing Cady's 1952 estimate by production since 1952 plus an equal amount of coal rendered unminable by such mining, and then adding reserves mapped in later studies. These reserves, classified by principal seam, are shown in figure 4.

We regard this estimate, as it has been defined, to be conservative. We are confident that continuing studies of Illinois coal resources will discover further reserves at a more rapid rate than the coal will be removed by mining or rendered unminable by mining for a number of years in the future. Large areas remain where coal-bearing strata are relatively untested, and there are areas where reserves data have been assembled on only the better

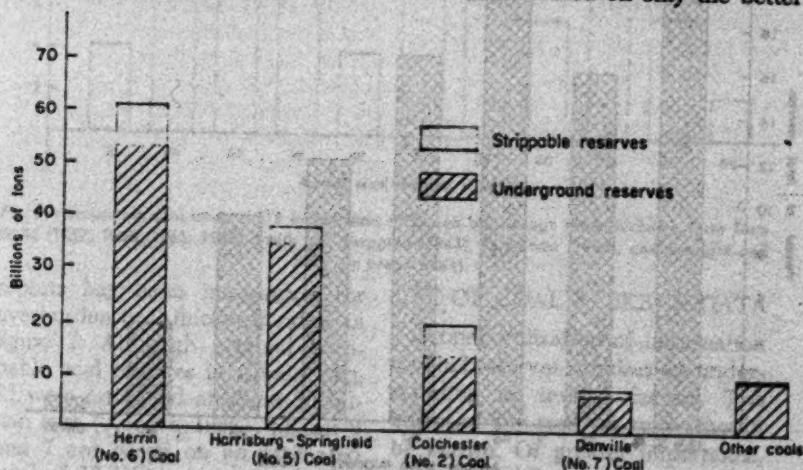


Fig. 4—Coal reserves (140 billion tons) of Illinois by coal seam. Data from Cady et al. (1952), Smith (1957, 1958, 1961, 1968), Smith and Berggren (1963), Reinertsen (1964), and Searight and Smith (in preparation).

known No. 6 and No. 5 Coals, although these are underlain by from several hundred to more than 1000 feet of coal-bearing strata in which coal thickness is not well known.

The Cady (1952) report on minable coal reserves of Illinois defined minable coal as being 28 inches or more thick. Most of the coal considered in the study was at depths of less than 1000 feet and none exceeded 1300 feet; no classification by depth was made.

Four classes of reliability, based on the quality of data used, were established and reserves computed for each coal seam at 1-foot intervals of average thickness. The

published data were grouped by county, although calculations also had been made for each township. Figure 5 of the present study shows reserves by generalized average thickness.

Because coal as thin as 18 inches had been strip mined in Illinois, this thickness was used as the minimum in the strippable coal reserves studies (Smith 1957, 1958, 1961, 1968, Smith and Berggren 1963, Reinertsen 1964, and Searight and Smith, in preparation). Reserves of strippable coal have been estimated and published for each township, by coal seam, at one-foot intervals of average thickness. Two cate-

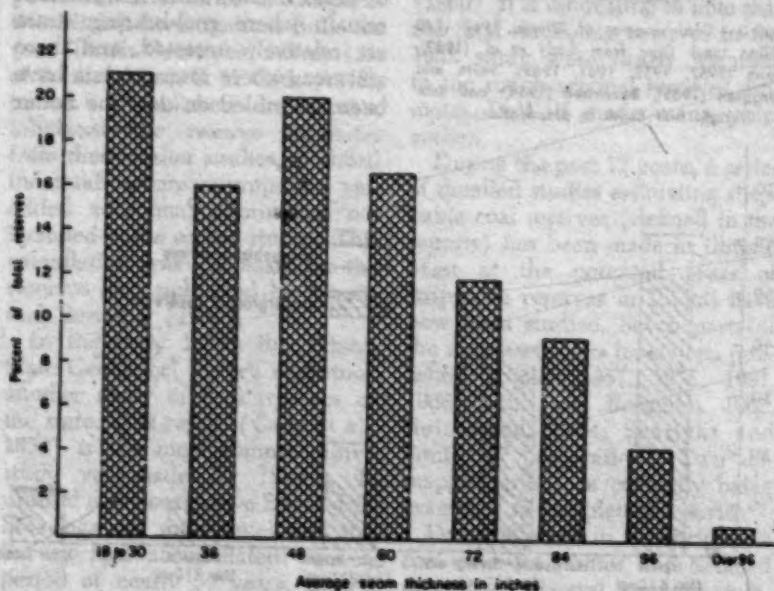


Fig. 5—Total coal reserves (140 billion tons) of Illinois by average seam thickness. Data from Cady et al. (1952), Smith (1957, 1958, 1961, 1968), Smith and Berggren (1963), Reinertsen (1964), and Searight and Smith (in preparation).



gories of reliability, based on the quality of the data, have been used. Overburden was divided into categories of 0-50, 50-100, and 100-150 feet. Strippable reserves by average seam thickness are shown in figure 6. Data from this series of published

coal reserves are completed. The original reserve figure cited by Averitt includes coal that has been mined and a preliminary estimate of reserves in the two areas yet to be mapped for the strippable coal reserves series.

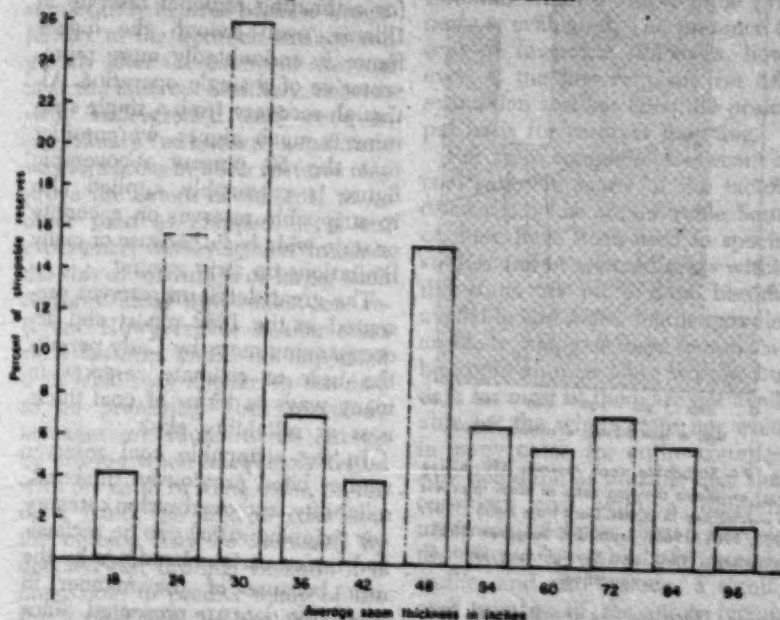


Fig. 6—Strippable coal reserves (19 billion tons) of Illinois by average seam thickness. Data from Smith (1957, 1958, 1961, 1968), Smith and Berggren (1963), Reinertsen (1964), and Searight and Smith (in preparation).

reports has been interpreted for overburden coal-thickness ratios in figure 7. Although original strippable coal reserves in Illinois (fig. 3) were estimated at about 23 billion tons (Averitt, 1968), figures 6 and 7 are based on an estimated total of 19 billion tons (remaining in the ground) only for the areas for which the reports on strippable

#### USE OF COAL RESERVE DATA

Proper utilization of information on coal reserves requires an understanding of several factors. The object of any reserves study should be known. Of greater importance, perhaps, are the definitions used in each study, particularly terms such as "minable" or "strippable" re-



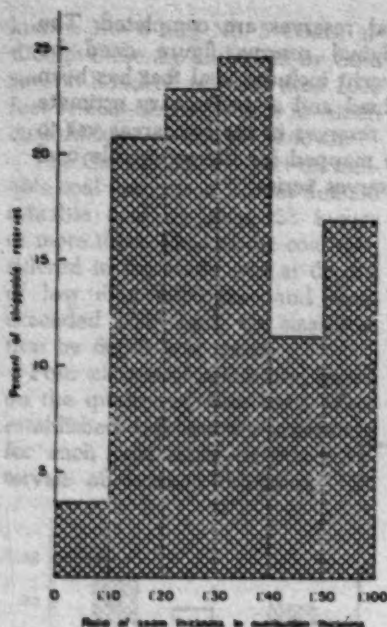


Fig. 7—Strippable coal reserves (19 billion tons) of Illinois showing ratio of seam thickness to overburden thickness. Data from Smith (1957, 1958, 1961, 1968), Smith and Bøggren (1963), Reinertsen (1964), and Seoright and Smith (in preparation).

serves. Because, as mentioned previously, economics and technology are not fully considered in most studies of reserves, consideration of "minable reserves" must take this fact into account.

Distinction should be made between total coal in the ground and "recoverable" coal. Long-term general practice has indicated that 50 percent is a reasonable estimate of the amount of minable coal reserves recoverable. A recent study by Lawrie (1968) reported 57 per-

cent of coal recoverable in modern underground mines. Considering losses of coal left between mines, surface culture that will not permit mining, and other factors making the coal unavailable, we regard 50 percent as a better recovery figure for estimating regional reserves in Illinois, even though the higher figure is undoubtedly more representative of a single operation. Although recovery from a single strip mine is much higher, we consider that the 50 percent recoverable figure is reasonably applied also to strippable reserves on a county or state-wide basis because of many limitations on strip mining.

The great detail on reserves presented in the 1952 report and accompanying maps by Cady permits the user to estimate reserves in many ways in terms of coal thickness or reliability class.

In the strippable coal reserves studies cited previously, thickness, reliability, and overburden category (or stripping ratio) can be reclassified under various headings by the user because of the manner in which the data are presented. Since thickness of reserves are generally reported at 6-inch to 1-foot intervals of average thickness, any minimum thickness greater than the 18-inch minimum used in these studies can be selected and any overburden limit can be assumed. Strip mine overburden limits are indicated on maps at 50, 100, and 150 feet, but estimates for intervening intervals can be made reasonably accurately.

The coal reserves data published

for Illinois has been misused in some cases. It is not always recognized that many areas of the state have been mapped from inadequate data. In such areas details on relatively small acreages, particularly in the case of strip coal, may be significantly in error because irregularities in the bedrock surface can greatly alter the extent of the coal near the outcrop. Similarly, in areas with underground coal reserves, previously unknown sandstone washout areas or other features may prove the extent of the coal to be other than as mapped. It is our experience, however, that in areas the size of townships or larger such features have little effect on reserves. However, for smaller areas such features could be important if in what may appear on the map to be promising (but untested) acreages are found to be cut up by erosion when adequately tested with the drill. In some cases, on the other hand, the area of coal near the outcrop may be increased by detailed test drilling. Because it is impossible to predict many of the small preglacial valleys that may reduce the coal mapped as available, we feel that there will generally be more reduction than increase of the shallow reserves with less than 50 feet of overburden. Again, however, we emphasize that this does not significantly reduce over-all reserves estimates as defined in recent studies published by the Geological Survey, even though tracts of up to several hundred acres may be found to be adversely affected when tested in detail.

#### OTHER FACTORS NEEDED FOR COAL RESERVES EVALUATION

Reserves estimates of coal in the ground in large areas have not included all of the data that are essential when a single mine property is evaluated. The presence of coal of favorable thickness, however, is the first requisite for any evaluation and has been the principal basis for reserves mapping.

For more complete assessment of coal reserves, many of the factors discussed below are desirable. Some of these have been used in special studies and in selected areas within the state. As more data become available and more detailed studies are done, many of these factors can be applied much more widely, but data for most of them are not available for the whole state nor even, in many cases, for entire counties. Any definition of minable coal that considers coal with a different minimum thickness than is used in the Survey's published reserves studies and also includes a significant number of the other factors discussed below will, of course, produce total reserve figures different from those reported in recent reserves studies. This, however, does not change the reserve figures as defined in these studies.

Within the limits of this paper, little more than a listing is practical to indicate the many other factors desirable for assessing coal reserves. Although such information is reliable now for only small areas, sufficient data may someday be

available to permit their use in state-wide evaluations.

### QUALITY

Coal quality should be considered in evaluating reserves. Evaluation of quality may include rank, fixed carbon, volatile matter, heating value, moisture, ash, totals and varieties of sulfur, chloride-alkali content, petrographic composition, and coking characteristics. Rank, heating value, moisture, and chloride-alkali content show systematic variation so that at least some known reserves could be, or have been, mapped in terms of these factors.

### DEPTH

Although sufficient data are available for mapping coal reserves by depth categories, this has not generally been done in Illinois, because most mapped reserves lie at depths of less than 1,000 feet and practically none of them are below about 1,300 feet. However, deeper coals are believed to occur, with thicknesses great enough to be considered reserves as defined in most previous studies, and a classification based on depth for coals (other than the strippable coal reserves that are now so classified) seem desirable. For Illinois, eventually a breakdown that would include coal reserves to a depth of 1,000 feet, 1,000 to 2,000 feet, and greater than 2,000 feet might be appropriate. It is unlikely that there is any coal deeper than 2,500 feet within the state.

### MINING CONDITIONS

The factors controlling mining conditions are perhaps the most significant determinant of the "minability" of coal reserves, but these are also among the most difficult to assess on a broad-area basis. They include the quality of the potential mine roof and floor strata, hardness of the coal, water conditions, mined-out areas in higher and/or lower coals, character of overburden, and a wide variety of geologic features that may profoundly affect mining, such as faults, cutouts, horsebacks, rolls, whitetop, and igneous intrusions. Only mined-out areas and many coal washout areas are sufficiently well known to have been used to modify reserves. Although the actual areas mined out have been excluded from recent estimates, no modification has been made for coals present above or below a mined-out area.

### ECONOMICS

The economic effects of factors that influence the "minability" of coal are constantly changing. Among the more vital factors to be considered economically important are capital and mining costs, markets, and availability of transportation and its cost. Such factors not only vary with time, but for any given time may vary significantly in different parts of the state.

### LAND AVAILABILITY

Although factors concerned with land availability are closely related to economic considerations, many

of their other aspects are important. They include the availability of a sufficiently large block of coal, land that can be acquired, exclusions resulting from towns, railroads, highways, and similar features, and oil field areas. Current reserves estimates have excluded all areas heavily drilled for oil and gas. It is quite probable that future technology may permit mining of such areas, which would then result in significant increase in reserves mapped to date.

#### REGULATIONS AND CONTROLS

Evaluation of a potential mine site may involve several additional factors, most of which would be difficult to apply to an assessment of statewide coal reserves. They include controls on water supply, waste or refuse disposal, mining regulations, stream and air pollution, and reclamation requirements.

#### CONCLUSIONS

Published coal reserves data for broad areas may be a valuable guide in economic evaluation and planning. If used with full understanding of the premises on which the estimate is based, they can also be an aid to exploration. Total coal resources (all coal in the ground) in Illinois are considerably larger than estimates of reserves, and as more information becomes available, significant additional quantities of the coal resources of the state will be added to reserves, as reserves are defined in most existing reserves estimates. Although

total coal reserve estimates of Illinois are considered to be conservative as defined in Survey studies to date, minable or strippable reserve estimates based on these data will be smaller if mining is restricted to thicker seams or the estimates are modified by definitions of economic minability. They would also be increased by including thinner seams.

There is not, and never has been on the national or state level, any intention to suggest that coal with a minimum thickness of 14, 18, 28, or more inches, is minable throughout the areas mapped, even though such thicknesses have been and are being mined in favorable situations. Data presented in recent studies for Illinois, however, provide the basis for estimates to be made within any of the defined thickness limits and for any defined overburden limits.

Illinois is in a most favorable position for a greatly expanded coal industry because of the quantity of its reserves, and its relatively thick and flat-lying seams. Other factors favorable for at least broad areas of the state that were mentioned but not discussed in detail in the report insure a bright future for the coal industry in Illinois. Much work remains to be done to assess minable coal reserves in terms of quality, mining conditions, economics, and other factors. Programs of the Illinois Geological Survey are being applied to fill this need where sufficient data are available.



## SLO. DEP. EXHIBIT 1

bcc: Mr. J. M. Morris  
Mr. R. J. Hepburn

January 21, 1963

Mr. Robert S. Overbeck, General Manager  
Raw Materials Division  
Aluminum Company of America  
1501 Alcoa Building  
Pittsburgh 19, Pennsylvania

Dear Mr. Overbeck:

Thank you for your letter of December 13, 1962 in which you answered the questions raised in my letter of November 29, 1962.

We appreciate the thoughtful consideration given to United Electric's position in respect to conducting the mining operation when Alcoa wishes to exploit the Beaucoup Field, as set out in paragraph (a) of your letter.

Also, we understand that should United Electric be confronted with a specific opportunity to furnish coal that could be supplied from Beaucoup Field, Alcoa is willing to consider seriously leasing part of Beaucoup Field to United for that purpose. This, as set out in paragraph (b) of your letter.

We agree with you that there were no commitments other than those spelled out in the written agreement and we accept your judgment as to the understanding stated in Paragraphs (a) and (b) in your letter.

In regard to the third point raised in my letter of November 29th our thought had been to explore the possibility of leasing from Alcoa the top tier of sections in Beaucoup Field, that is, from east to west Sections 14, 15, 16, 17, 18 and 13, and we appreciate your willingness to discuss the idea. As you probably know we have been leasing and optioning the coal immediately north of the sections listed above and now have some 23 million tons under control, a location we refer to as the Round Prairie Field.



Since my letter to you we have decided to expand our holdings in Round Prairie to a minable reserve rather than work out a leasing arrangement with Alcoa, in the meantime, however, trusting that leasing from Alcoa continues to be a possibility for future discussion.

Thanking you for your attention to these matters.

Sincerely,

Secretary

## STEINER DEPOSITION EXHIBIT 1

August, 1969

## VITA

Peter O. Steiner

**Personal:**

Born: July 9, 1922, New York City

**Education:**

Oberlin College—A.B. (Magna Cum Laude)	1943
Harvard University—M.A. Economics	1949
Ph.D. Economics	1950

**Employment:**

1944-1946	USNR
1947-1949	Teaching Fellow in Economics, Harvard
1949-1957	Lecturer, Instructor, Assistant Professor, University of California, Berkeley
1957-1959	Associate Professor of Economics, University of Wisconsin
1959-1968	Professor of Economics, University of Wisconsin
1968-	Professor of Economics and Law, University of Michigan

**Fellowships:**

Social Science Research Council, Faculty Research Fellow, 1956-1959  
 Guggenheim Fellow, 1960-1961  
 Ford Faculty Research Fellow, 1965-1966

**Ph.D. Thesis:** *Workable Competition in Radio Broadcasting* (Harvard, 1949)

**Publications:****Books:**

*Productivity* (with William Goldner) (University of California, Berkeley, 1952).

*An Introduction to the Analysis of Time Series* (Rinehart & Co., New York, 1956).

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STEINER DEPOSITION  
EXHIBIT 2U.S. v. General Dynamics, et al.

## MEMORANDUM OF EXPECTED TESTIMONY

of

Peter C. Steiner

Professor of Economics and Law  
University of Michigan

1. Coal mining today is in the midst of a period of change so rapid and so pervasive that it has required, and continues to require, major readjustments in the structure and patterns of coal production and distribution. This rapidly changing context compels a dynamic, rather than static, examination of the structure of coal mining and of the role and effectiveness of competition. To analyze or evaluate the structure and patterns of coal production and distribution out of this context of pervasive change in the conditions of both demand and supply invites the confusion of cause with effect, and overlooks the success of coal producers in providing the nation with the benefits of vigorous competition.

2. While coal mining has suffered many set-backs since its heyday of the 1920's, the changes since World War II have provided a major challenge. Importantly, the railroad market has totally disappeared, the space heating market has virtually disappeared and the industrial steam coal market has declined. Thus, increasingly, coal producers have had to look to the electric utilities as the major source of their demand, and to adapt themselves to new requirements in order to compete effectively.

The decline in the number of producing firms from 1957 to 1967 illustrates the working of economic evolution: viable organizations have survived and those that were not have disappeared. The period of rapid change and basic challenge to individual coal producers, and coal mining as a whole, has not ended. The utilization of nuclear energy is playing a major role in the current expansion program of electric utilities, and can only increase in the decades ahead. The increasing concern with air pollution provides a related but further threat to coal producers. Meeting anti-pollution requirements is bound to adversely affect coal's ability to compete with other fuels. This will result from the increased costs of using lower sulphur coals or in providing effective anti-pollution devices for existing grades of coal.

3. Competition as a goal of public policy is designed to assure low prices, to assure prompt response by suppliers to changes in patterns of demand and to keep producers under continuous pressure to find new and better ways to satisfy consumers' wants. Lack of effective competition may frustrate each of these purposes and lead to higher prices, to unaggressive and unresponsive behavior and to a generally unprogressive industry. The appropriate test of the competitiveness of any industry is its performance in these respects. The record shows that coal production has adapted to the change in the pattern of demand thrust upon it, and has managed to

increase productivity enough so that despite rising unit labor costs, the delivered price of energy from coal has remained stable. That it has done so by major innovation in the production, preparation, loading and marketing of coal is testimony to the effectiveness of competition both among coal producers and between coal and other energy sources.

4. The data show that over this period the size of mines has increased, the size of coal companies has increased and the number of viable mining companies has decreased. These things are not, as the Government complains, the symptoms of a lessening of competition, but are instead adaptations by coal producers to changes imposed upon them by the changes in the demand for coal and competition in the energy market. The increasing predominance of the electrical utilities as purchasers of steam coal, the increase in the designed capacity of new electric generation units, and utilities' insistence on a large, reliable, and low price source of fuel over the 20 or 30 year life of a generating facility, lead inexorably to the emergence and survival of coal producers with large reserves, developing large mines which are devoted to serving a small number of customers on long term contracts. The pressure to achieve low transportation costs on a freight-intensive commodity has reinforced the need for the long term commitment that only a large company with substantial reserves can credibly contract to provide.

5. The progressive disappearance of the small producer reflects the disappearance of the railroad market and the decline of the space heating market, the retail market and spot coal purchases by utilities. The need to commit vast reserves of coal to each major contract has led to the disappearance of producers with small reserves as active competitors in the utility market and has led to the assembling of large blocks of coal reserves under single managements. Competition among coal producers is characteristically no longer the competition of salesmen for coal already produced, but is instead the competition for long term supply contracts. Typically, the opening of a mine is geared both to a given long term contract, a given plant location, and a previously negotiated freight rate. This gives a special quality to competition that manifestly is not of a kind in which a small producer or a producer without large reserves can effectively compete.

6. The competitive viability of a producing company in the utility market is today measured not by its current production, nor by its current profits or cash flow, but, instead, by its ability to compete in the market for new long term contracts. This requires availability of acceptable reserves and of low cost transportation, and sufficient creditability both to assure performance on a contract and to acquire the funds necessary for producing the coal. For the same



reasons, the comparative competitive strength among coal producers and their prospective market positions should be measured by the quantity, quality and location of their reserves, rather than by their current or past levels of production.

7. The growth of mine size and the share of production by large coal producers is a direct response to the intense competition for the utility business both between coal producers and among competing fuels. Substitutability between coal and some competing energy sources exists even with existing facilities. Many of these already have the capability for alternative fuel use, and others could readily acquire it. The fact that coal continues to supply so much of the energy requirements of the electrical utilities reflects the success of coal producers in delivering coal at a low cost per BTU. That it has done this, despite sharply rising costs, reflects the technological revolution that has led to enormous increases in productivity, and to the ability to negotiate bulk shipment and unit train freight rates. Both coal prices and coal rail rates have increased far less than other prices in the economy. But these innovations, which make competitive prices possible, have created the need for large scale production, and thus for large companies.

8. The longer run competition among fuels concerns the design and location of new facilities rather than the

utilization of existing facilities. The dramatic emergence of nuclear energy as a competitive force is shown in the record. Coal producers will in fact be under continuing pressure to reduce costs and keep prices low if they are to retain their last remaining large market for steam coal. Again, coal's relative disadvantage, vis-a-vis other fuels, with respect to air pollution regulations increases the pressure upon it. The large coal company has no easy life nor protected position.

9. Electric utilities typically regard fuel purchasing as a top executive responsibility and the buyers are characteristically sophisticated about the available alternatives. This is another source of pressure on coal producers to seek to minimize costs and to keep prices low. The large utilities purchase coal in quantities that give them substantial market power, preventing any excess of bargaining power on the part of the producers. Utilities have and use the ability to play coal producers against one another. Moreover, some utilities possess their own coal reserves which add to their bargaining strength. Finally, inter-fuel substitutability provides an additional bargaining advantage to utilities.

10. In the context of this litigation, anti-merger policy should seek to preserve a sufficient number of alternative sources of supply to customers to assure competitive

behavior. This requires that we identify the relevant customers and their sources of supply, and examine the roles of United Electric and Freeman therein. In my view, the only significant product market within which to evaluate the competitive effect of the UEC-Freeman case is the supply of energy for electricity generation. The broad geographic area in which the midwestern utilities purchase energy is in fact a series of different markets. Defining the precise boundaries within which a particular utility generating station can purchase fuel is a complex but manageable matter that depends on the transportation routes available, freight rates, and technical characteristics of the fuel. Not all coal producers in the State of Illinois can effectively bid on all coal contracts. While two mines producing coal will often have some area in which they may both ship at equal cost, each will have areas where it is in a position to exclude the other supplier.

11. In negotiating for new locations of electric generating stations there are often wide alternative sources of supply both among fuels, and among producers of a given fuel. Once a facility is located and its equipment designed to utilize particular fuels, the alternative sources of supply have been narrowed. But characteristically, most of its fuel requirements have already been assured by that time, through long term supply contracts with one, or at most a few, suppliers.

12. In my judgment, on the basis of the record to

date, the UEC-Freeman combination does not have the effect of reducing competition, nor would a divestiture increase competition, for several reasons. First, because of its lack of reserves of the necessary quantity, quality and location, UEC alone is no longer able to compete effectively for meaningful long term supply contracts. Its inability to acquire additional strip reserves and its lack of underground capability are well documented. Second, because a combined UEC-Freeman does not represent excessive market power. The combined operation faces vigorous competition from other large coal producers, it faces the ever present threat of displacement of coal by competing fuels and it faces large and sophisticated buyers across the bargaining table. Third, because of differences in the location of its mines, in the quality of its coals and in the nature of its transportation routes, Freeman and UEC have long been predominantly complementary rather than competitive producers. Many of the common customer shipments identified in the record reflect this complementarity. Where common customers have existed, there is in the main no shortage of bargaining power on the part of the purchasers such that they have been disadvantaged by the common ownership.

August 14, 1969

Source Material

1. Report of Paul Fair Co.
2. Report of Seversky Environmental Dynamics Research Associates.
3. Report of John E. Organ.
4. Statement of Expected Testimony of Bruce C. Netschert, and attachments thereto.
5. Statement of Expected Testimony of Abraham Gerber, and attachment thereto.
6. Department of Justice Statistical Exhibits.
7. Deposition Testimony.
8. Complaint.
9. Interrogatory Answers of the Parties.



MID-WEST COAL PRODUCE INSTITUTE, INC.  
307 North Michigan Avenue  
Chicago 1, Illinois

TERLEKE DEPOSITION  
EXHIBIT 2

REPORT OF MINE PERFORMANCE - MONTH OF DECEMBER 1957 and 1958, AND  
ACCUMULATION-JANUARY THROUGH DECEMBER, 1957 and 1958 FOR ILLINOIS  
INDIANA AND WESTERN KENTUCKY, BY DISTRICTS

Company by Districts	Mine	1957 December Tons & Days Worked	1958 December Tons & Days Worked	1957 Jan. thru Dec. Tons & Days Worked	1958 Jan. thru Dec. Tons & Days Worked
<b>No. III.</b>					
Peabody	No. III.	78,735 (20)	71,109 (22)	613,116 (241)	586,153 (172)
<b>Fulton Co.</b>					
Big Ten	Big Ten	15,304 (23)	17,723 (17)	171,942 (189)	151,889 (162)
Fairview	Flamingo	72,936 (17)	72,554 (17)	637,585 (155)	544,596 (127)
Peabody	Key	27,967 (18)	65,472 (24)	433,409 (208)	489,052 (207)
Midland	Hi. Grove	54,019 (22)	59,772 (22)	607,382 (262)	629,072 (222)
"	Vulcan	65,073	62,278 (22)	687,685 (211)	539,479 (189)
Morgan	Edwards	16,087 (26)	23,755 (25)	135,682 (276)	144,105 (247)
Stonesfort	L. John	43,644 (18)	53,801 (20)	406,455 (169)	352,002 (146)
Trux	Flatt	136,657 (18)	151,587 (22)	1,486,983 (210)	1,400,348 (194)
"	L. Sister	44,825 (16)	76,171 (21)	591,889 (160)	575,821 (155)
United	Buckheart	113,678 (21)	119,490 (22)	1,234,861 (230)	1,151,297 (217)
"	Cuba	70,605 (17)	97,670 (23)	828,135 (211)	759,386 (176)
<b>TOTAL</b>		<b>664,825 (217)</b>	<b>800,273 (235)</b>	<b>7,302,008 (2281)</b>	<b>6,787,047 (2042)</b>

**Atkinson**

Midland	No. 2	66,750 (20)	63,233 (26)	872,045 (261)	489,796 (188)
	No. 5	49,115 (21)	90,792 (26)	162,936 (102)	584,279 (190)
<b>TOTAL</b>		<b>115,865 (41)</b>	<b>154,025 (52)</b>	<b>1,034,981 (363)</b>	<b>1,074,075 (378)</b>

**Cent. III.**

Peabody	#17	127,830 (12)	-	2,060,583 (200)	-
Freeman	Crown	158,242 (16)	178,125 (18)	1,602,483 (176)	1,578,624 (166)
Peabody	#10	293,683 (18)	304,205 (18)	3,677,756 (227)	2,902,214 (171)
<b>TOTAL</b>		<b>579,755 (46)</b>	<b>482,330 (36)</b>	<b>7,340,822 (603)</b>	<b>4,480,838 (337)</b>

**Danville**

B & Z	Wardock	37,063 (19)	46,691 (23)	421,868 (237)	477,006 (233)
Fairview	Harnattan	74,441 (19)	99,156 (23)	672,777 (170)	720,184 (176)
United	H. Moore	26,655 (15)	31,650 (19)	315,829 (175)	282,609 (170)
<b>TOTAL</b>		<b>138,159 (53)</b>	<b>177,497 (65)</b>	<b>1,410,474 (582)</b>	<b>1,479,799 (579)</b>

# 1888

Company by Districts	Mine	1957 December Tons & Days Worked	1958 December Tons & Days Worked	1957 Jan. thru Dec. Tons & Days Worked	1958 Jan. thru Dec. Tons & Days Worked
<b>Bellefonte</b>					
Nt.O.Ast.	Staunton	-	-	198,146 (75)	-
B & Z	Spartan	49,513 (14)	79,569 (22)	624,493 (170)	626,313 (174)
Luzaghi	Ah	56,378 (18)	77,187 (23)	572,559 (179)	530,089 (158)
Mid-Cont.	Gr. Dis.	66,260 (21)	84,062 (26)	720,454 (223)	804,808 (240)
Sv. Ill. Co.	Streamline	85,882 (20)	113,059 (26)	816,650 (204)	963,046 (232)
Morgan	Millstadt	12,825 (22)	15,879 (26)	100,200 (184)	97,497 (172)
Peabody	Niv. King	151,528 (20)	139,480 (20)	552,365 (96)	1,695,017 (238)
"	Seminole	66,437 (21)	75,959 (25)	648,071 (227)	671,608 (215)
"	Nid. Nod.	71,667 (24)	80,550 (26)	670,403 (244)	681,068 (220)
"	St. Ellen	128,102 (21)	144,623 (26)	1,226,491 (221)	1,285,444 (221)
Truax	Pyramid	80,270 (13)	128,400 (20)	995,856 (160)	1,096,897 (175)
United	Fidelity	92,110 (15)	121,258 (20)	1,240,418 (220)	1,138,844 (185)

TOTAL 860,972(209) 1,060,026(260) 8,366,106(2203) 9,590,631(2231)

## DuQuoin

Truax	Burn, Star	100,458 (19)	114,901 (21)	1,087,890 (210)	1,100,143 (204)
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## So. Ill.

B & Z	Zeig, #3	92,357 (18)	129,804 (25)	151,901 (86)	-
"	Buckhorn	77,980 (16)	90,523 (23)	938,095 (195)	1,104,103 (207)
Carmac	Carmac	29,906 (20)	33,145 (21)	757,022 (168)	869,142 (193)
"	Dele	78,334 (21)	92,958 (26)	215,158 (244)	242,148 (162)
For. Cart.	F. Mason	15,800 (11)	20,576 (15)	784,781 (213)	835,847 (226)
Freeman	Orient #2	108,909 (17)	119,209 (20)	185,215 (118)	159,696 (106)
"	Orient #3	233,160 (18)	266,552 (23)	1,072,758 (169)	1,071,377 (173)
"	Freeman #4	102,928 (20)	106,933 (21)	3,010,200 (237)	3,032,633 (238)
Peabody	Herrin	37,443 (19)	54,472 (26)	1,220,034 (245)	1,189,907 (242)
"	#3	-	-	409,530 (215)	406,130 (202)
Old Ben	#9	161,455 (19)	172,015 (21)	220,708 (50)	-
"	#14	100,804 (19)	126,190 (22)	1,851,850 (218)	1,972,739 (230)
"	#22	68,418 (19)	86,104 (24)	970,128 (193)	1,089,585 (213)
Sahara	#5	52,549 (18)	70,249 (22)	678,284 (188)	536,757 (138)
"	#6	51,707 (15)	68,527 (18)	556,879 (185)	569,378 (190)
"	#7	-	-	589,675 (169)	622,113 (172)
"	#16	54,738 (17)	74,997 (21)	62,475 (107)	-
Stonefort	Willi. Scar.	54,838 (21)	70,808 (24)	586,409 (183)	559,302 (179)
Utility	Utility	-	27,723 (23)	747,083 (240)	735,624 (240)

TOTAL SOUTHERN ILL. 1,321,406(288) 1,610,785(375) 15,110,185 (3023) 15,157,053 (3244)

TOTAL ILLINOIS 3,840,175(893) 4,471,246 (1066) 42,495,882 (9906) 40,255,739 (9227)

INDIANA

Company by Districts	Mine	1957 December Tons & Days Worked	1958 December Tons & Days Worked	1957 Jan. thru Dec. Tons & Days Worked	1958 Jan. thru Dec. Tons & Days Worked
<u>Clinton</u>					
Ayrshire	Chinook	52,743 (19)	56,462 (18)	495,066 (164)	544,629 (172)
"	Sunspot	9,636 (8)	26,345 (19)	70,441 (47)	113,364 (75)
Snow Hill	Wileydale	40,378 (18)	38,074 (20)	507,562 (230)	442,753 (218)
"	Gr. Valley	111,462 (20)	136,231 (24)	1,288,239 (241)	1,297,921 (235)
Blacks	Viking (Conv.)	45,580 (17)	52,754 (22)	629,109 (237)	581,085 (232)
TOTAL		259,799 (82)	309,866 (103)	2,990,417 (919)	2,979,752 (932)

Linton

Enoco	Enoco	58,097 (17)	69,268 (21)	731,873 (210)	666,039 (189)
Fairview	Minnehaha	44,234 (21)	53,852 (26)	421,148 (203)	434,214 (203)
Huamoo	Cheifton	50,394 (17)	61,013 (21)	478,165 (161)	472,690 (154)
"	Linton #28	28,895 (13)	45,322 (21)	313,262 (150)	310,835 (136)
"	Old Glory	14,195 (10)	15,638 (13)	119,552 (99)	113,659 (92)
"	Airline	76,496 (21)	97,492 (22)	717,563 (240)	760,478 (232)
Morgan	Kingman	5,294 (16)	8,314 (23)	41,803 (135)	47,601 (137)
Shasta	Shasta	29,680 (13)	31,967 (14)	348,317 (162)	330,538 (143)
Sher. Temp.	Friar Tuck	44,536 (16)	55,587 (20)	481,829 (162)	425,450 (147)
TOTAL		351,821 (144)	438,453 (181)	3,653,512 (1522)	3,561,504 (1433)

Princeton

Ayrshire	Ayr. (BC)	22,712 (13)	36,001 (19)	312,451 (166)	287,630 (147)
"	Ayr. (Cato)	19,353 (13)	17,637 (11)	198,165 (117)	132,011 (82)
Blackfoot	Blackfoot	70,620 (25)	83,859 (26)	667,104 (208)	650,859 (215)
Enos	Enos	147,157 (23)	181,188 (26)	1,476,476 (236)	1,432,891 (212)
Ingle	Dit. Hill	43,218 (16)	47,130 (24)	476,272 (153)	351,229 (143)
Peabody	Lynnville	115,811 (14)	130,931 (14)	1,295,670 (183)	994,913 (131)
"	Tecumseh	84,756 (17)	106,589 (21)	837,821 (143)	743,248 (144)
Princeton	King Sta.	41,303 (13)	64,610 (21)	318,990 (97)	434,560 (136)
TOTAL		552,926 (134)	667,945 (162)	5,582,949 (1303)	5,027,341 (1210)

Boonville

Boonville	Wright	91,993 (21)	95,864 (20)	1,077,041 (211)	1,052,137 (203)
Peabody	Victoria	118,195 (20)	82,977 (14)	1,122,214 (202)	1,135,491 (187)

TOTAL BOONVILLE - 210,188 (41) 178,841 (34) 2,199,255 (413) 2,187,628 (390)

TOTAL INDIANA - 1,374,734 (401) 1,595,105 (480) 13,756,225 (3965)  
14,426,133 (4157)

1840

## WESTERN KENTUCKY

Company by Districts	Mins	1957	1958	1957	1958
		December Tons & Days Worked	December Tons & Days Worked	Jan. thru Dec. Tons & Days Worked	Jan. thru Dec. Tons & Days Worked
W. Kentucky					
Gibraltar	Gibraltar	129,286 (22)	160,074 (21)	1,580,595 (213)	1,626,376 (233)
Beech Cr.	Pond Cr.	37,724 (19)	38,107 (19)	416,037 (220)	401,861 (210)
B & Z	Moss Hill	18,091 (20)	20,702 (25)	123,796 (159)	159,513 (188)
"	Oriole	65,265 (16)	84,779 (21)	745,834 (181)	784,493 (184)
Colonial	Colonial	51,289 (19)	61,161 (21)	710,054 (250)	668,260 (222)
Paradise	Paradise	63,987 (19)	136,461 (20)	875,317 (215)	1,120,153 (241)
P. & Mid.	Dekoven	114,410 (20)	78,409 (18)	929,061 (219)	971,697 (244)
Dawson	Collierie	31,928 (20)	32,272 (22)	311,717 (207)	352,225 (224)
Dawson	Daylight	34,525 (20)	33,977 (22)	325,530 (210)	345,836 (223)
Hart	Pr. Washed	63,283 (24)	56,876 (21)	726,532 (264)	682,587 (242)
Kirkpat.	Caney Cr.	51,516 (20)	52,573 (19)	540,501 (230)	548,255 (227)
Peabody	Vogue	60,384 (25)	143,150 (23)	462,199 (1)	1,076,648 (228)
"	Ken	169,915 (17)	208,825 (24)	2,197,139 (254)	2,066,959 (219)
"	Riv. Queen	96,884 (23)	256,507 (26)	180,075 (48)	2,161,565 (249)
"	P. River	35,491 (12)	69,217 (26)	257,267 (1)	571,678 (208)
"	Wh. City	142,530 (24)	136,498 (24)	1,372,410 (226)	1,213,610 (200)
"	Old Homes	30,733 (20)	-	405,926 (1)	449,046 (75)
"	Alston	-	-	149,682 (71)	-
"	Seneca	-	-	433,469 (140)	-
United	Buff. Cr.	30,441 (21)	22,016 (17)	250,778 (152)	195,429 (127)
"(R.C.W.)	Huby	51,019 (20)	55,397 (19)	642,075 (246)	620,110 (239)
W.Vy. Coal	L. Diamond	95,715 (16)	128,936 (22)	1,312,806 (208)	1,212,219 (198)
"	Pl. View	108,921 (18)	121,969 (20)	1,375,610 (221)	1,202,891 (203)
"	Atkinson	51,660 (11)	-	480,265 (115)	206,934 (52)
"	Fies	70,501 (14)	97,619 (17)	1,012,233 (191)	1,034,853 (179)
"	Crescent	46,984 (15)	60,009 (16)	711,960 (193)	637,355 (179)
"	Uniontown	114,580 (16)	97,746 (19)	1,275,036 (198)	1,066,692 (165)
"	Williams	38,018 (20)	42,239 (22)	364,076 (205)	424,229 (206)
TOTAL W. KENTUCKY 1,802,780 (491) 2,195,519 (504) 20,175,980 (3) 21,503,482 (5165)					

TOTAL W. KENTUCKY 1,802,780(491) 2,195,519(504) 20,175,980(X) 21,503,482 (5165)

TOTAL ILLINOIS (1785) (2050)  
INDIANA, AND 7,037,689 8,261,870 77,097,995(X) 75,515,446 (18,357)  
WESTERN KENTUCKY

TOTAL - UNITED STATES 492,195,000\* 398,448,000\*

Report No. 12

\* - Estimated.  
/ - Not available  
% - Incomplete - so not shown.  
( ) - Days Worked.

January 8, 1959



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MID-WEST COAL PRODUCERS INSTITUTE, INC.  
 307 North Michigan Avenue  
 Chicago, Illinois

GOVERNMENT  
 MINING  
 Tex. Dep.  
 11

REPORT OF MINE PERFORMANCE - NORTH OF DECEMBER 1966 AND 1967 AND  
 ACCUMULATION - JANUARY THROUGH DECEMBER 1966 AND 1967 FOR ILLINOIS,  
 INDIANA AND WEST KENTUCKY, BY DISTRICTS

Company by Districts	Mine	1966	1967	1966	1967
		December Tons & Days Worked	December Tons & Days Worked	Jan. thru Dec. Tons & Days Worked	Jan. thru Dec. Tons & Days Worked
No. Ill.					
Peabody	No. Ill.	84,158 (26)	82,017 (25)	907,576 (285)	753,845 (256)
Fulton Co.					
Ayrshire	Sun Spot	77,010 (26)	89,623 (25)	761,601 (256)	803,117 (255)
Mid. Elec.	Mid. Grove	112,775 (19)	96,630 (18)	1,657,262 (253)	1,373,647 (222)
Peabody	Bri. Star	50,579 (19)	52,918 (23)	502,903 (213)	508,783 (222)
"	Edwards	54,149 (26)	26,149 (16)	189,132 (267)	526,131 (266)
"	Key	-	-	211,006 (86)	-
Pioneer	#1	15,082 (24)	20,609 (25)	116,099 (215)	117,507 (210)
Stonewort	Allendale	68,217 (24)	12,359 (20)	590,374 (210)	570,665 (221)
Trux	Flatt	148,841 (20)	242,889 (24)	1,603,670 (210)	1,523,095 (222)
"	L. Sister	64,630 (21)	-	983,335 (223)	917,864 (223)
United	Hammer	74,994 (25)	65,180 (21)	809,240 (276)	834,021 (280)
"	Backheart	141,139 (18)	204,267 (24)	2,033,621 (240)	1,903,933 (239)
"	Cuba	94,839 (21)	57,883 (14)	931,886 (213)	973,987 (220)
	TOTAL	922,235 (243)	898,507 (213)	10,730,069 (2694)	10,093,010 (2580)
Atkinson					
Mid. Elec.	Necco	140,015 (24)	123,552 (24)	1,218,131 (238)	1,248,644 (237)
Cent. Ill.					
Freeman	Crown	215,672 (22)	176,494 (17)	2,284,278 (242)	2,380,150 (252)
Peabody	#10	501,158 (21)	493,029 (21)	5,634,795 (247)	5,711,599 (251)
Trux	Hillsboro	94,425 (21)	86,694 (18)	1,017,106 (239)	1,169,307 (232)
	TOTAL	811,255 (64)	756,217 (56)	8,936,179 (728)	9,260,756 (738)
Danville					
Ayrshire	Harstman	62,042 (17)	61,184 (18)	777,792 (192)	553,058 (172)
B & Z	Kurdoch	66,038 (21)	59,496 (21)	653,624 (234)	745,766 (240)
	TOTAL	128,080 (38)	120,680 (39)	1,431,416 (426)	1,313,844 (415)



# 1842

Company by Districts	Mine	1966	1967	1966	1967
		December Tons & Days Worked	December Tons & Days Worked	Jan. thru Dec. Tons & Days Worked	Jan. thru Dec. Tons & Days Worked
<u>Belleville</u>					
B & Z	Spartan	75,261 (21)	83,336 (21)	826,485 (236)	882,421 (237)
Mid. Elec.	Gr. Dia.			259,292 (73)	
Peabody	Midwest	118,906 (26)	110,565 (24)	1,273,090 (295)	1,410,796 (288)
"	Riv. King	419,519 (25)	433,912 (25)	4,453,420 (282)	5,316,366 (289)
Sv. Ill. Coal	Captain	530,650 (26)	487,840 (28)	5,196,407 (353)	5,807,683 (344)
"	Streamline	167,775 (26)	93,286 (21)	1,590,390 (292)	1,718,903 (300)
Truax	B-Star #2	114,687 (19)	66,253 (14)	1,484,342 (227)	1,482,643 (233)
"	B-Star #3	245,058 (21)	167,008 (22)	1,378,510 (132)	1,613,575 (256)
United	Fidelity	190,317 (24)	149,572 (21)	2,080,251 (269)	2,031,157 (265)
TOTAL		1,862,173 (188)	1,591,772 (176)	18,542,217 (2159)	20,463,744 (2212)

## DeQuoin

Truax	B. Star #1	—	—	396,219 (94)	—
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## So. Ill.

Ayrshire	Delta	75,198 (20)	73,185 (19)	787,442 (213)	996,808 (260)
B & Z	Zeig. #3	5,387 (3)	—	712,580 (210)	—
"	Zeig. #4	96,773 (20)	100,815 (20)	1,073,150 (242)	1,270,193 (252)
Freeman	Orient #3	295,375 (22)	226,823 (18)	2,767,835 (236)	3,026,857 (254)
"	Orient #4	101,671 (19)	110,346 (17)	1,112,600 (239)	1,365,606 (247)
"	Orient #5	152,288 (22)	119,930 (13)	1,541,997 (252)	1,567,863 (229)
Old Ben	# 9	117,068 (20)	60,640 (12)	1,664,778 (253)	1,384,188 (239)
"	#21	229,486 (22)	137,163 (16)	2,625,398 (264)	2,235,521 (255)
"	#24	227,270 (23)	163,650 (18)	1,752,692 (271)	2,369,630 (272)
Peabody	Eagle	—	21,247 (13)	—	309,668 (124)
"	Energy	33,670 (20)	44,341 (23)	521,423 (246)	505,410 (247)
"	Utility	35,876 (22)	29,946 (18)	433,456 (237)	517,551 (257)
Sahara	# 5	64,596 (19)	68,768 (22)	796,472 (228)	753,835 (245)
"	# 6	86,733 (15)	82,489 (17)	1,024,185 (202)	1,082,170 (202)
"	#16	96,196 (20)	83,054 (21)	1,014,182 (229)	987,521 (241)
Stonsfort	Willi Sc.	120,280 (25)	68,692 (23)	1,133,518 (227)	1,380,861 (271)
<b>TOTAL</b>		<b>1,740,867 (292)</b>	<b>1,409,033 (270)</b>	<b>18,961,708 (3549)</b>	<b>19,791,446 (3595)</b>

<b>TOTAL ILLINOIS</b>	<b>5,691,803 (875)</b>	<b>4,981,808 (803)</b>	<b>61,143,513 (10,173)</b>	<b>62,925,509 (10,036)</b>
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## 1843

INDIANA

		1966	1967	1966	1967
Company by Districts	Mine	December Tons & Days Worked	December Tons & Days Worked	Jan. thru Dec. Tons & Days Worked	Jan. thru Dec. Tons & Days Worked
<u>Clinton</u>					
Ayrshire	Chinook	101,911 (26)	97,940 (25)	1,145,755 (274)	1,163,071 (281)
<u>Linton</u>					
Ayrshire	Minnehaha	108,092 (20)	152,898 (21)	1,579,344 (244)	1,742,214 (243)
"	Thunderbolt	120,728 (23)	10,832 (6)	1,256,457 (258)	986,286 (207)
Peabody	Air-Hart	94,772 (23)	184,682 (22)	1,651,196 (233)	2,421,227 (274)
"	Chieftain	42,525 (13)	48,211 (16)	469,351 (129)	480,328 (154)
"	Old Glory	77,739 (26)	59,744 (24)	707,304 (238)	596,321 (224)
TOTAL		443,856(105)	456,367 (89)	5,663,652(1102)	6,226,376(1102)
<u>Princeton</u>					
Enos Coal Corp.	Blackfoot	140,859 (26)	120,644 (20)	1,434,692 (247)	1,457,797 (251)
"	Enos	157,591 (23)	142,239 (24)	1,570,311 (229)	1,673,122 (244)
Kings St Coal	Kings	10,975 (8)	66,130 (23)	72,419 (52)	337,189 (192)
Peabody	Lynnville	267,204 (26)	283,184 (23)	2,958,225 (287)	3,396,064 (285)
Princeton	King Sta.	—	—	170,180 (59)	—
TOTAL		576,629 (83)	612,197 (90)	6,205,830 (874)	6,866,172 (972)
<u>Eden Mills</u>					
Ayrshire	Wright	109,261 (23)	100,990 (25)	1,174,545 (243)	1,300,557 (272)
Peabody	Victoria	62,300 (17)	61,837 (17)	721,942 (155)	896,713 (210)
TOTAL		171,561 (40)	162,827 (42)	1,896,487 (398)	2,197,270 (482)
TOTAL INDIANA		1,293,957 (254)	1,329,331 (246)	14,911,724 (2646)	16,454,869 (2837)

1844

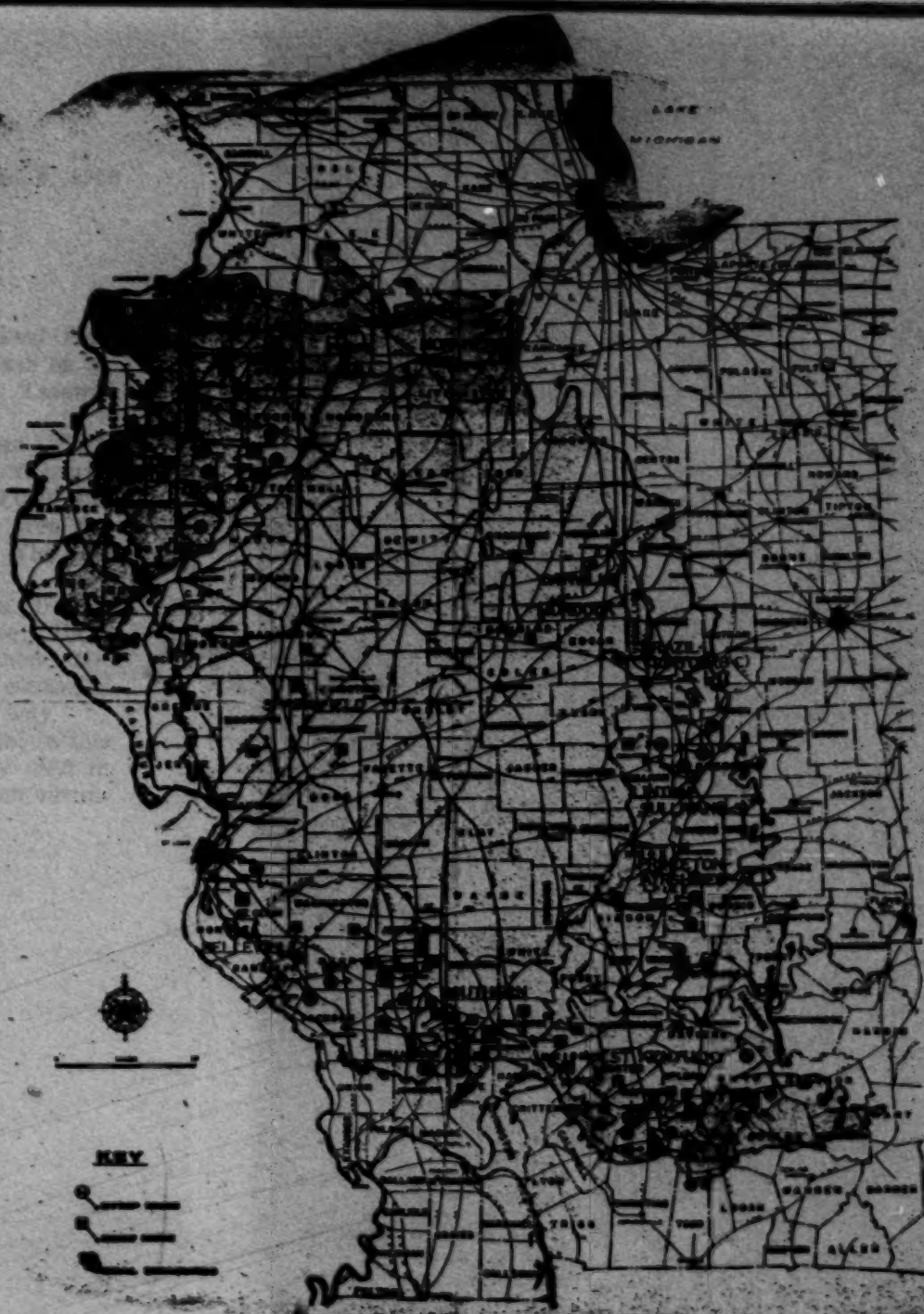
## WEST KENTUCKY

Company by Districts	Mins	1966	1967	1966	1967
		December Tons & Days Worked	December Tons & Days Worked	Jan. thru Dec. Tons & Days Worked	Jan. thru Dec. Tons & Days Worked
W. Kentucky					
Gibraltar	Gibraltar	207,147 (26)	233,138 (25)	2,105,676 (252)	2,087,820 (244)
B & Z	Oriole	96,732 (21)	—	917,980 (216)	631,713 (200)
"	Zeig. #9	—	138,129 (21)	—	410,808 (74)
Colonial	Colonial	155,226 (23)	154,555 (18)	1,347,999 (220)	2,022,205 (261)
Paradise	Paradise	264,528 (19)	208,206 (17)	2,484,577 (207)	2,090,546 (193)
P. & Mid.	DeKoven	366,751 (23)	183,853 (20)	3,214,904 (236)	2,936,755 (257)
"	Drake	—	2,280 (8)	—	2,280 (6)
Kirkpatrick	Caney Cr.	71,928 (19)	54,977 (18)	760,896 (210)	879,355 (234)
Pashody	Homestead	210,264 (26)	192,109 (24)	2,229,691 (258)	2,353,431 (285)
"	Xen	171,497 (25)	200,326 (21)	2,456,417 (268)	2,379,106 (261)
"	Riv. Queen	391,657 (26)	457,401 (25)	3,809,422 (284)	5,043,519 (300)
"	Riverview	83,602 (23)	84,193 (17)	584,434 (237)	1,054,354 (262)
"	Vogue	267,687 (26)	161,328 (24)	2,563,213 (269)	2,703,110 (272)
V. Ky. Div.	Atkinson	138,776 (23)	134,441 (22)	1,089,700 (227)	1,471,874 (251)
(Island Cr.	Boone	34,363 (19)	31,619 (15)	242,769 (167)	418,394 (204)
Coal Co.)	Crescent	97,659 (22)	69,084 (22)	989,591 (222)	1,048,894 (245)
"	East Dis.	265,364 (23)	170,226 (19)	2,370,146 (219)	2,374,379 (243)
"	Flea	135,649 (22)	138,681 (22)	1,222,766 (216)	1,413,424 (245)
"	Pl. View	52,164 (16)	—	520,710 (175)	565,614 (163)
"	Uniontown	144,456 (23)	122,924 (22)	1,461,989 (221)	1,490,635 (249)
"	Williams	24,305 (22)	22,556 (20)	234,174 (216)	236,497 (216)
"	Was. Slurry	4,276 (3)	—	29,446 (22)	11,050 (7)
Wright Coal	Wright	42,871 (21)	39,356 (20)	525,642 (213)	521,079 (238)
TOTAL W. KENTUCKY		3,229,902 (451)	2,819,382 (403)	31,162,142 (4557)	34,177,042 (4912)
TOTAL - ILLINOIS, INDIANA AND WEST KENTUCKY		10,215,662 (1580)	9,130,521 (1452)	107,217,379 (17,378)	113,557,440 (17,785)

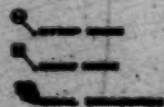
Report No. 120

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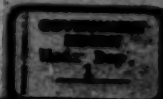
January 12, 1968

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**KEY**



**SHIPP**











## WEIR DEPOSITION EXHIBIT 8

August 5, 1959

Mr. R. J. Hepburn:

*Re: #2 Coal South of Illinois River*

In looking over our maps and those obtained from CILCO, there appears to be an area of coal south of the Illinois River located in Springfield Township, Tazewell County, Illinois.

As you know, this will have to be checked as CILCO drilling was intent on the lower geological structures. However, there appears a possibility of 8,000,000 tons with an average overburden of 35 feet in an area due south of Bessie Smith, Dempsey, and Sprague. The land is bottom land.

In going about getting drilling information, I have talked to Mr. J. M. Morris suggesting we use CILCO for obtaining drilling rights, etc. As you know, Mr. George Otto is a consulting geologist and is connected with them at this time. I feel this is the best way.

Any information we obtain by drilling for coal in this area would be valuable to CILCO as they have used in the past our coal drilling north of the river to an advantage.

R. H. INMAN

RHI:J

cc: Mr. J. M. Morris  
Mr. T. H. Latimer

1847

WITH DESCRIPTION EXHIBIT 3

August 1, 1909

Wier Dep. Ex. 19-  
8/5/0

72

Re: The Coal Lands of Illinois River

in looking over our maps and those obtained from  
CISCO there appears to be an area of coal south of the  
Illinois River located in Springfield Township, Tazewell  
County Illinois  
To be checked as CILCO  
Lower geological strata  
consisting of 8,000,000 feet  
with an average thickness of 88 feet in an area of  
south of Booneville, Kentucky and Springfield. The land  
is bottom land.

In going about getting drilling information I have  
referred to Mr. J. H. ... suggesting we use CILCO  
for conducting drilling tests. As you know Mr.  
George Q. is a consulting geologist and is connected  
with them at this time. I feel that in the past we have  
Any information we obtain by drilling for coal  
area would be referred to CILCO as they have  
the past our coal drilling north of the river to an area



PAUL WEIR COMPANY

GEOLOGICAL ENGINEERS ... GEOLOGISTS



PAUL WEIR  
COMPANY

S. H. INMAN

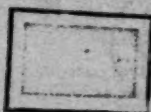
REPLY

cc: Mr. J. M. Morris  
Mr. T. H. Johnson

1848

2828

Wier Dep. Ex. 19. 18  
8/5/69  
73



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ENGINEERS... GEOLOGISTS

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1849

SERVING THE MINING INDUSTRY SINCE 1936



## PAUL WEIR COMPANY

MINING ENGINEERING, GEOLOGY AND ECONOMICS

*Geology and Exploration*  
*Mining and Mining Facilities*  
*Beneficiation and Utilization*  
*Mineral and Mining Economics*  
*Feasibility Studies and Evaluations*  
*Resources Development*  
*Planning, Budgeting and Staffing Problems*  
*Supervision of Project Implementation*  
*Operations and Management*  
  
*For Underground and Surface Mining*

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## about our company and procedures

Established in 1936 by Paul Weir, the firm has enjoyed a record of continuous growth and expanding activity. Over the years, the Paul Weir Company has built a reputation, of which we are proud, for successful and dependable performance both within the North American continent and abroad. Our policies permit no deviation from the highest professional and engineering standards.

Because the Paul Weir Company does not manufacture, sell or distribute machinery or equipment, our recommendations are completely unbiased and impartial, assuring selection of procedures, methods and facilities best suited to any specific need or conditions.

Upon authorization for any assignment, whether large or small, the principal officers of the Paul Weir Company first analyze all aspects of the project, outline and supervise the necessary work, then prepare or review the eventual final report or recommendation. Additionally, throughout every project, any special problems arising in the various fields of geology, mining, engineering, beneficiation, utilization, construction, training, economics, management or operations are referred to the close scrutiny of those principals or staff experts highly qualified in the particular field involved.

When staffing teams in the field on projects abroad we place emphasis on the ability of our personnel to function without friction both within the company group and with the technical staff and residents of the host country. On major projects abroad we are prepared to establish fully integrated teams in the field with the ability and authority to execute the work and make necessary decisions on the spot, without the necessity of referring problems and decisions to the home office, except in unusual circumstances. The home office at all times, however, continues to provide field teams with back-up information, support and advice as required.

With the experience derived from many years of specialized consulting services as well as that embodied in the combined professional background of the principal staff, the Paul Weir Company has compiled a comprehensive library of technical publications, authoritative information and data. This material is available to all staff members and provides supplementary aids and expedient suggestions for solution of new project problems.

Our extensive and comprehensive library, accumulation of resources, and methods for rapid interpretation, resulting from our many years of intensive experience in the various fields of practice and participation, enable us to offer fast and efficient and well substantiated

recommendations, based upon our participation in operations of investigation and supervision of all phases of mining operations, either direct or indirect, through the planning, work and execution of projects, periodic review of operating policies and procedures.

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## SERVICES



The Paul Weir Company offers a complete range of consulting and engineering services on a world-wide basis to owners, producers and users of coal, other solid fuels, and mineral resources in general.

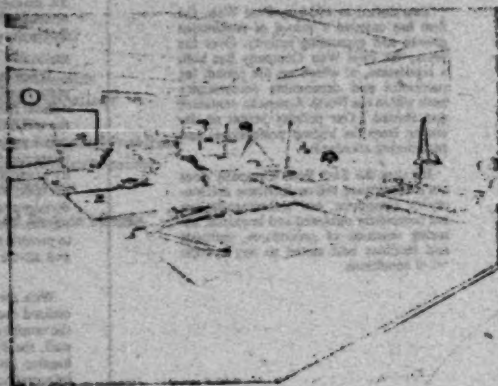
It serves owners and operators of mineral properties, public utilities, railroads, financial institutions, insurance companies, industrial users and government agencies.

The Paul Weir Company is prepared to execute both field work and/or office work as required. Teams of selected specialists can be provided for short-term assignments in the field or in the office, or fully integrated technical teams can be put in the field and maintained any place in the world for comprehensive long-term projects.

In the development of operating projects—and especially those located in newly developing areas of the world—control practices for labor, materials and maintenance are established as required to fit local conditions in order to achieve effective preventive maintenance and maximum effectiveness and economy of each facility involved. Training seminars are conducted for local supervisory personnel as required to assure effective implementation of such practices and programs.

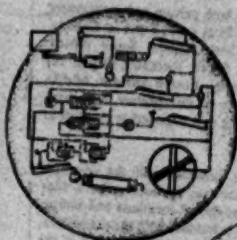
For many clients, the Paul Weir Company has undertaken responsibilities beyond those associated with engineering services, such as the selection of personnel for top management and operating positions.

On the following pages are specific examples of what we do, which may serve as suggestions to our clients of ways in which we might be of service.





*The services available to Watco clients range from exploration and mapping of virgin deposits through any or all phases to final development of a project at full production level.*



#### **Geology and Exploration**

Reconnaissance; field geology; mapping; supervision of drilling; sampling; interpretation of results.

#### **Engineering, Surveys, Reports, Recommendations**

Valuations and appraisals of physical and intangible property; analyses of virgin or active properties; overall economic and resource surveys; complete project feasibility studies, including engineering aspects, transportation, market, and projected costs; investigations of and recommendations on special problems or specific phases of operation or project.

#### **Engineering and Design**

Design and development of details of mines and mine plant; preparation of engineering drawings for installation and construction; determination of specifica-

tions and bills of material; engineering cost estimates.

#### **Development and Construction**

Recommendations, scheduling, coordination, organization and administration of development and construction; preparation of contracts and purchase orders; direct or advisory supervision of construction and erection; inspection and examination of and reports on construction and construction programs; supervision of acceptance tests; training of operating, maintenance and supervisory staff.

#### **Mechanization**

Determinations of potential extent, economic effect and practicable application of mechanized methods; recommendations on most appropriate types of equipment; design and supervision of installation of mining systems;

critical analysis for improvement of methods; establishment of preventive maintenance programs and training of personnel.

#### **Beneficiation**

Investigation of coal and mineral preparation and beneficiation problems; determination of economic effect of and methods for quality improvement; development of flow sheets and designs; selection of facilities and supervision of erection and acceptance tests; research on solid fuel utilization and coal carbonization.

#### **Management, Supervision and Administration of Operations**

Administration and supervision of all phases of mining operations, either direct or advisory; organization of operating staff and selection of personnel; periodic review of operating policies and problems.



## EXPERIENCE



The Paul Weir Company has performed consulting and engineering services for numerous operating companies of all sizes. Specialized technical services have also been provided to a large variety of interests such as railroads, public utilities, financial groups and institutions. We have served the U. S. Departments of Interior, Health, Education and Welfare, and Justice; the Army Corps of Engineers; the Atomic Energy Commission; and various executive agencies of the government concerned with Foreign Aid.

Domestic assignments have been carried on throughout the U.S.A.

On work abroad our clients include both private and government interests. Foreign assignments have been carried out in Canada, Mexico, Brazil, Colombia, Chile, Great Britain, South Africa, North Africa, Australia, Indonesia, South Vietnam, Korea, the Philippines, Portugal, Turkey, Germany, France and the Middle East. Additionally, various members of our present staff have been personally associated with mining and engineering projects in other countries.

The Paul Weir Company has been associated with the investigation and development of coal and mineral deposits under a wide variety of physical circumstances, geographical locations and indigenous economic conditions. Our staff is familiar with the equipment, methods and techniques available from and applied in most of the industrially advanced nations. This broad experience can be utilized to find the most suitable and practicable answers to your problems.



## TYPICAL ASSIGNMENTS DOMESTIC AND FOREIGN

- *Mining Companies*
- *Financial Institutions*
- *Utilities*
- *Industrial Users*
- *Railroads*
- *Government Agencies*
- *and Others*

Supervised drilling program to establish reserves, layout and design of new shaft entry and preparation plant, followed by supervision of shaft sinking, mine development and surface construction. For a mining company.

Retained by a major chemical company for advisory services on all phases of mining of deep crustal, a medium carbonate mineral. Weico acted in the development of mining methods, application of equipment, and forward planning for production of this unique raw material for soda ash.

As part of a joint industrial group serving as general advisors and supervisors for overall economic and industrial development on a national level, Weico had responsibility for all services encompassing the mining field, including coal, ferrous and non-ferrous minerals. Resources investigated included asbestos, lignite, lead, zinc, silver, gold, copper, iron, graphite, nickel and pyrite.

Modernization of mining in planning beds, including recommendations for mechanization, housing and health-care programs with estimates of capital and operating costs. For a mining company in Canada.





# TYPICAL ASSIGNMENTS DOMESTIC and FOREIGN (continued)

Determination of source, costs of development and production of raw materials for a sulphuric acid plant, including surveying, mapping, and setting up a diamond drilling program.

Investigation of optimum coal lands by drilling program, followed by determination of mining and transportation costs to power plant, with comparison of reserves and competitive costs from other sources. A utility company.

A Weirco team composed of specialists in mining, beneficiation, mechanical and electrical engineering served as principal consultants (resident in the field) on the overall development and modernization of a coal field. Services also included training of local personnel in safety, maintenance and industrial engineering practices. The initial project involved a capital investment of more than 200 million dollars. Starting in late 1949 Weirco's services have been retained on subsequent expansion programs projected to 1975.

Investigation and report on conversion of shallow underground gypsum mines to a stripping operation, including recommendations on equipment, technique, operating methods and costs.

For a cement plant, assignment included geological survey, supervision of core drilling and sampling, and relation of all raw materials reserve findings to plant expansion. Studies included availability of fuel, power and water, and economic factors.

Feasibility study to evaluate existing coal strip mining operation, and analyze all transportation, marketing and economic factors related to possible expansion. Based on conclusions, recommendations for production expansion including mine design, equipment, method of operation, preparation plant, transport and handling facilities, and capital and operating cost estimates.

Investigation of stripable reserves followed by recommendations for operation and transportation and handling from mine plant to rail and river loading points. For a mining company.

Nation-wide analysis of coal reserves suitable for synthetic liquid fuel manufacture for United States Department of the Interior and Army Corps of Engineers.

For a lead smelter, ascertain tonnage, grades of ore and concentrates for profitable operation. Study and recommend improvements in facilities, operation and management.

Critical review of all major areas of coal and lignite availability, nation-wide, for guidance of major oil company in evaluating studies of manufacture of chemicals and synthetic fuels, with determination of comparative data on quality, availability and potential cost.

Mapping and geological exploration in a remote region to establish reserves, mining possibilities and economic justification for production and basic use of coal deposits under conditions of national economy. Followed by resident team of engineers (mining, mechanical, construction, transportation) to provide technical services on development of mine and facilities.

Detailed survey of management policy, organizational structure and personnel performance for multiple-mine producer, with critical rating of existing staff and recommendations for improvements in organizational framework.

At request of a private company, Weirco principals analyzed conditions and evaluated two government-owned mines for submission of tender to purchase.

Certification of stripable and underground reserves for multiple-mine producing company having operations in six states, for use in registration statement required by Securities and Exchange Commission.

Complete design, specifications and supervision of construction of 22,000-ton bulk storage warehouse for salt products, adapted for shipments received by rail, truck or water.

Analysis of multiple-mine anthracite company's practices and reserves, followed by recommendations on future programs for modernization of mines and plant facilities, decentralization of maintenance and repair, reduction of overhead, retrenchment in selected high-cost operations, sales policies, contract mining and labor relations.

A Weirco team installed and supervised operation of an experimental mine for determination of most economic methods of mining and appropriate types of equipment under conditions of unique coal occurrence.

Preparation of flow sheet, design and specifications for new coal preparation plants and recovery facilities for various major coal producers, steel companies and utility interests, foreign and domestic.

Special studies and investigation of mineral beneficiation problems, including development of recommended flow sheets for beneficiation plants.

Special study of coal pipelining, including factors of coal supply, utilization, economics, and competitive position as transport medium.

Appraisal and evaluation of all physical and intangible assets of two multiple-mine companies, including reserves and operating properties, for purpose of merger negotiations.

For acquisition of a major coal company by a major oil company, assigned by the interests to make the engineering and economic evaluation of coal company reserves, mines and mine plant, including projection of long-range production tonnage and operating costs. An equivalent assignment was executed for the financing interests for acquisition of a second major coal company by a large steel-mining company.

Weirco team of engineering and operating specialists (resident on site) served as consultants and advisors on underground and open-pit mining operations and expansion at a copper mine abroad.

For a large coal mine producer, study, specifications, engineering layout and design of storage facilities and live-mine overhead belt-conveying system.

Engineering design of two mine shafts and inclined slope, specifications and engineering layout for crushing and screening station, belt-conveyor system, stock-piling and barge-loading facilities (5,000 t.p.h. capacity) for major coal-mining company.

Detailed field exploration program to establish quantity and quality of high-grade metallurgical coal reserves; flow sheet and specifications for preparation plant; check of all design and structural drawings.

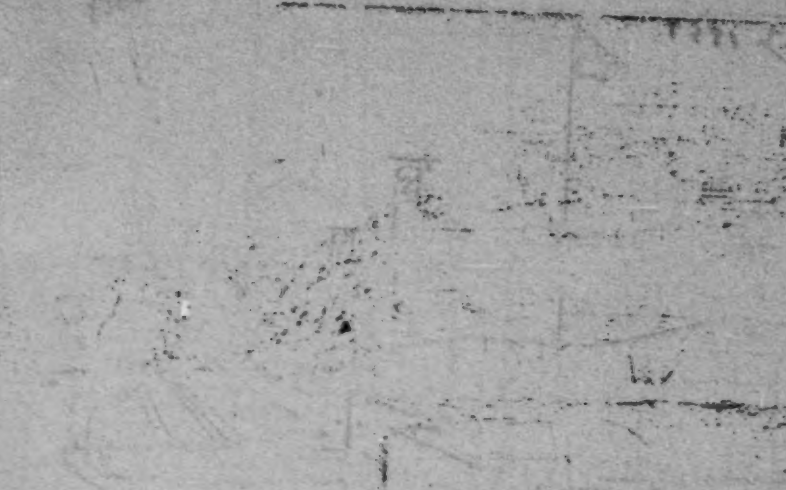


PAUL WEIR COMPANY

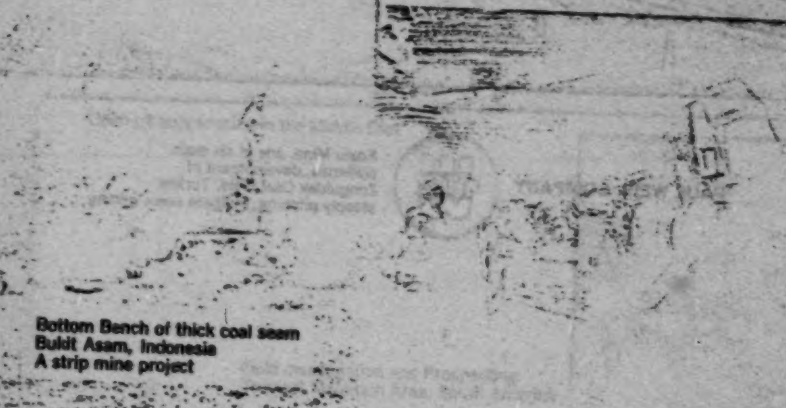
**Four and one-half mile belt conveying system  
from mine to river loading facility.  
Duquesne Light Company, Pennsylvania**



**PAUL WEIR COMPANY**



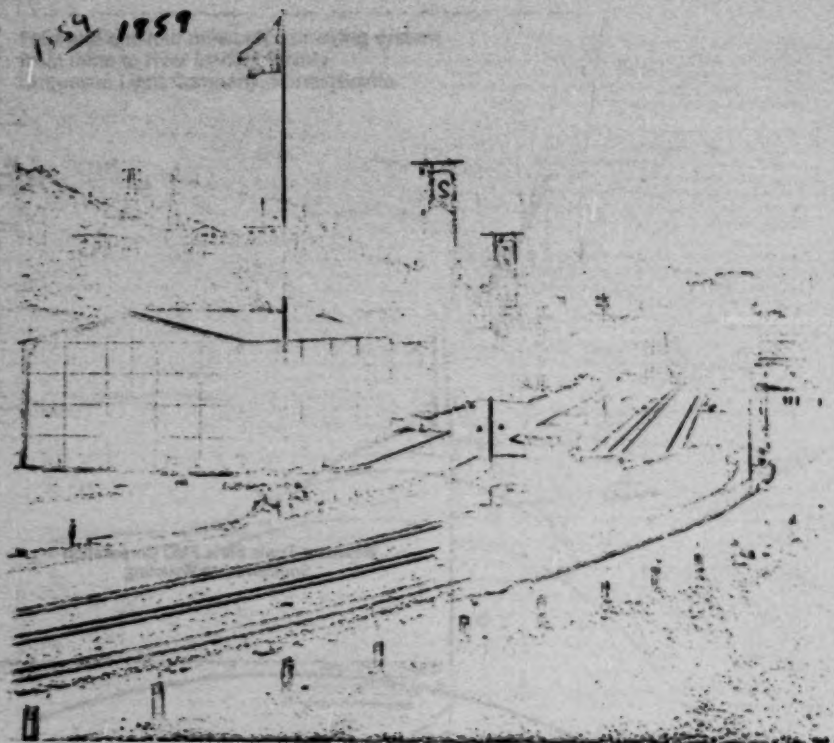
Westvaco Trona Mine FMC Corporation  
Southwestern Wyoming



Bottom Bench of thick coal seam  
Bukit Asam, Indonesia  
A strip mine project

1850

1854 1859



PAUL WEIR COMPANY



Kozlu Mine, one of six main  
collieries, development of  
Zonguldak Coal Field, Turkey,  
steeply pitching, multiple seam mining

PAUL WEIR COMPANY



1860



Open pit copper mine in the Middle East



Field Investigation and Prospecting  
Tropical Mountain Area, South America





## PAUL WEIR COMPANY

### PERSONNEL

The permanent staff of Paul Weir Company, based in Chicago, is a highly integrated team of experienced specialists of diverse capabilities—consultants, managers, engineers, geologists, designers, a comptroller and purchasing agent. Trained field engineers and supplementary technical staff are added as needed for projects anywhere in the world.

Through our years of steady growth we have selected our personnel carefully, with emphasis on technical training, practical experience, professional aptitude, sound judgment and analytical ability. Their accomplishments and abilities are measured by the results achieved for our clients (attested by the fact that much of our work is repeat business from a satisfied clientele) and by the recognition given them by their fellow professionals.

## PROFESSIONAL MEMBERSHIPS

### INCLUDE:

*American Institute of Consulting Engineers*  
*American Institute of Mining, Metallurgical and Petroleum Engineers*  
*American Institute of Professional Geologists*  
*American Mining Congress*  
*Coal Mining Institute of America*  
*Illinois Mining Institute*  
*Institution of Mining Engineers (U.K.)*  
*Geological Society of America*  
*Mine Inspectors Institute of America*  
*Mining and Metallurgical Society of America*  
*National Society of Professional Engineers*  
*Rocky Mountain Coal Mining Institute*  
*Society of Economic Geologists*  
*Western Society of Engineers*  
*American Association for the Advancement of Science*  
*American Chemical Society*  
*American Ordnance Association*  
*National Association of Colliery Managers (U.K.)*

**PAUL WEIR***Chairman of The Board*

Mr. Paul Weir received B.S. and E.M. degrees (Mining Engineering) from Pennsylvania State University. He is a Registered Professional Engineer, and is listed in *Who's Who in Engineering*.

Mr. Weir, founder of the company, is recognized internationally for his achievements and contributions to the mining industry. He is considered one of the outstanding authorities on the valuation of mines. He was the recipient in 1949 of the Erskine Ramsay Gold Medal Award given by the American Institute of Mining Engineers for outstanding work and service to the coal mining industry. Pennsylvania State University rewarded him with its Distinguished Alumnus Award in 1954. In 1957, Mr. Weir was elected to Honorary Life Membership in the Institution of Mining Engineers (United Kingdom).

Prior to the formation of Paul Weir Company in 1936, Mr. Weir served as engineer, Chief Engineer, and Vice President in Charge of Operations of an Illinois coal mining company.

He is the author of many articles in various technical journals.

Mr. Weir is a member of American Institute of Consulting Engineers; American Institute of Mining, Metallurgical and Petroleum Engineers (Past Chairman, Coal Division); Past Director, American Mining Congress; Coal Mining Institute of America; Illinois Mining Institute (Past President); Institution of Mining Engineers (U.K.); Mine Inspectors Institute of America; and Mining and Metallurgical Society of America. He has served on the Coal Resources Committee of the National Bituminous Coal Advisory Council and was appointed and served as a member of the United States Coal Mission to the United Kingdom in 1944.

His international travels have taken him to many areas of the world, and his personal attention has been given to projects in Australia, Brazil, United Kingdom, Scotland, South Africa, Turkey, Canada and West Germany.

CLAYTON D. PAUL

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**CLAYTON G. BALL**

President

Clayton Ball received his B.S. in Geology from Northwestern University, and both M.A. and Ph.D. degrees in Geology from Harvard University. He is a Registered Professional Engineer and Certified Professional Geologist, and is listed in *Who's Who in Engineering* and in *American Men of Science*.

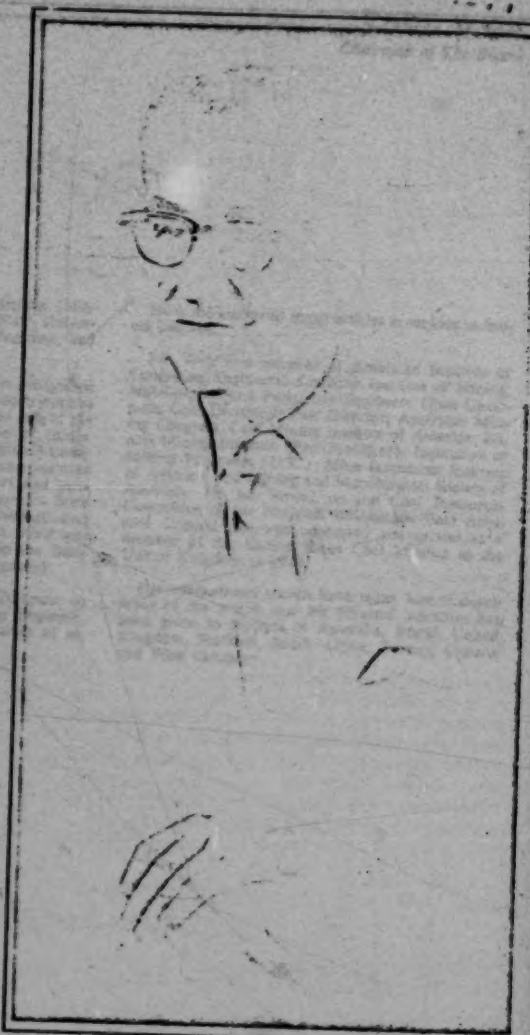
Dr. Ball's distinguished career as a geologist has earned him many professional honors. He is the Past Chairman, Coal Division; Past Chairman, Chicago Section; Past Chairman, Mineral Resources Division of the American Institute of Mining, Metallurgical and Petroleum Engineers; and Past President, Illinois Mining Institute. He is the author of numerous articles in technical journals, and is a recognized authority on the occurrence and mining characteristics of coal and lignite in the United States and many countries abroad.

He acted as Principal Mining Engineer, Mining Equipment Division, War Production Board, for a short period in 1943 and has served as Vice-Chairman, Coal Advisory Committee, Illinois State Geological Survey since its inception in 1948.

In addition to those already mentioned, his professional society memberships include the American Institute of Consulting Engineers, American Institute of Professional Geologists, Mining and Metallurgical Society of America, Society of Economic Geologists, and is Fellow in The Geological Society of America.

Dr. Ball was employed by the Illinois Geological Survey and also worked in the coal mining industry prior to joining Paul Weir Company in 1937.

His work abroad has taken him to Brazil, Chile, Colombia, Indonesia, Korea, Philippines, South Vietnam and Turkey.





**JOHN P. WEIR**  
Executive Vice President

"Jack" Weir received a B.S. degree in Chemical Engineering from Purdue University and a B.S. in Mining Engineering from Pennsylvania State University. He is a Registered Professional Engineer, and is listed in *Who's Who in Engineering*.

He has been employed by the Paul Weir Company since 1949 and has served Weirco on many of its most demanding assignments both here and abroad.

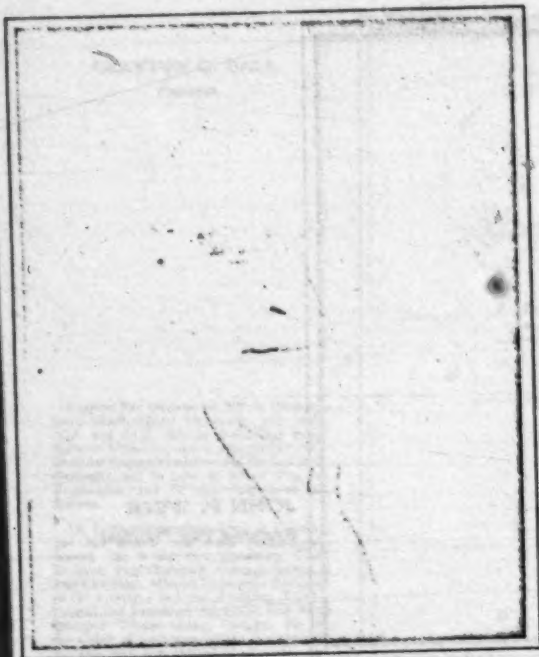
Activities throughout his career have provided him with an intimate knowledge of all facets of mining projects from the exploration and planning stages through application and operation of equipment and mining methods. Strata control has been one area of his major interests. The preparation of feasibility reports and reports for financing have often been his responsibility.

The Paul Weir Company prepared an independent engineering evaluation and economic study of the

coal mines and coal reserves of Peabody Coal Company in connection with the sale (in 1968) of Peabody's coal properties to Kennecott Copper Corporation subject to a reserved production payment. A similar study was made in connection with the purchase of Consolidation Coal Company by Continental Oil Company in 1966. In both instances, the direction and implementation of the investigation was under his close control.

His membership and offices in technical societies include the American Institute of Mining, Metallurgical and Petroleum Engineers (serving as a Member of the Executive Committee, Coal Division), a Past President of the Illinois Mining Institute, Institution of Mining Engineers (U.K.), Rocky Mountain Mining Institute, and Western Society of Engineers.

His foreign assignments have included Australia, Germany and South Africa.



# **JOHN E. GOOD**

*Vice President*

Mr. Good received his B.S. degree in Mining Engineering from Virginia Polytechnic Institute. He subsequently taught extension school classes in mining for Pennsylvania State University for several years. He joined Paul Weir Company in 1950.

Before joining Paul Weir Company, he had been first employed as an engineer by a multiple-mine coal company in Pennsylvania, and was night superintendent of a large coke oven plant.

He spent two years in Peru, employed by Cerro de Pasco Copper Corp. as an engineer and operating mine foreman. After Peru he received an assignment for mining investigations in Brazil by the United States Government under auspices of the (then) War Production Board and successor agencies, and later was employed by the U. S. Bureau of Mines and assigned as advisor to the Brazilian National Department of Mineral Production. After five years in Brazil on these assignments, Mr. Good acted as a private consultant to various foreign and American firms on investigations and reports on mining properties, and was retained by the U. S. Bureau of Mines on a consulting basis in connection with preparation

of certain foreign mining industry reports and publications.

After joining Weirco, he spent eight years as Resident Chief Engineer of a Weirco team of engineers in Turkey acting as principal consultants to the Turkish Government on development of the Zonguldak Coal Basin. This project involved all phases of large-scale multiple mine development, from initial studies and recommendations through specifications, layout and general design, construction and putting plant and facilities into operation.

Since returning to home office base in 1958, in addition to administrative responsibilities on foreign projects, he has executed specific assignments on foreign and domestic projects involving investigations, feasibility studies, mine development planning and technical reports. Since 1958 his activities on foreign projects have included Mexico, Colombia, Indonesia, South Vietnam, Portugal and the Middle East.

Mr. Good is a member of the American Institute of Mining, Metallurgical and Petroleum Engineers and the American Institute of Consulting Engineers. His honorary society memberships include Tau Beta Pi and Omicron Delta Kappa.



**RAYMOND E. ZIMMERMAN**  
Vice President

Mr. Zimmerman received his B.S. in Mining Engineering and his E.M. degree from Pennsylvania State University. He is a Registered Professional Engineer. He joined Paul Weir Company in 1954.

His professional career includes extensive experience in coal preparation and utilization, mineral beneficiation, coal carbonization, testing, evaluation, specifications, cost projections, and direction of research. His experience also includes the operational aspects of plants and processing facilities.

Mr. Zimmerman was responsible for an exhaustive research of European coal preparation practices which has had significant influence on up-dating procedures in England, Holland, Belgium and Germany.

He is listed in *Who's Who in Engineering and American Men in Science and Education*. He is the co-author of the classic treatise *Coal Preparation*

published by the American Institute of Mining Engineers which is now in its third edition. Many of his technical writings pertaining to coal preparation, processes and mineral preparation have been published in technical magazines and other publications.

His professional society memberships include the American Institute of Mining, Metallurgical and Petroleum Engineers; Illinois Mining Institute; Institution of Mining Engineers (U.K.); American Association for the Advancement of Science; National Society of Professional Engineers; and American Ordnance Association. His honorary society memberships include Sigma Gamma Epsilon (Mining), Sigma Xi (Research and Science), and Phi Lambda Upsilon (Chemistry and Physics).

Mr. Zimmerman's foreign assignments have included projects in Europe, Indonesia, Iran, Mexico, Peru, Japan and Turkey.

**ERWIN GAMMETER***Vice President*

Mr. Gammeter received his B.S. in Mining Engineering and his E.M. degree from Missouri School of Mines and Metallurgy.

He has been associated with the Paul Weir Company since 1945, with a leave of absence from 1952 to 1956 to serve the Hamilton Overseas Contracting Company in Turkey as Project Manager on a major tunnel-driving project on the coast of the Black Sea.

He brought a wealth of experience to his work at Weirco with a background as mining engineer for multiple-mine coal companies in Illinois, Kansas and Oklahoma.

His specialties are mine development and mine construction.

From 1958 to 1961 he served as Department Manager, Coal Mining, for a team of Paul Weir Company engineers and geologists in Korea, serving as Consultants to the Korean Government.

Mr. Gammeter is a member of the American Institute of Mining, Metallurgical and Petroleum Engineers; the Illinois Mining Institute; and Tau Beta Pi honorary society.

Foreign assignments on which he has been actively engaged include Brazil, Korea and Turkey.

**DAVID J. KACHIK***Vice President*

Mr. Kachik received his B.S. in Mining Engineering and his M.S. in Mining Geology from Pennsylvania State University.

He was a former Instructor in Mining and a Research Associate at Pennsylvania State University, and has been with Weirco since 1949. He is an expert in the fields of mine operation and production, mine management, and drilling programs with regard to underground operations. An area of particular interest to Mr. Kachik is the application of longwall mining methods.

He is a member of the American Institute of Mining, Metallurgical and Petroleum Engineers; Illinois Mining Institute; and Coal Mining Institute of America.

Foreign assignments have taken him to England, South Africa and South Vietnam.





DONALD H. DOWLIN

Vice President

Mr. Dowlin received his Engineer of Mines degree from the Colorado School of Mines, and is a Registered Professional Engineer. He joined the Paul Weir Company in 1964.

Earlier in his career he was employed by various major coal companies, during which period he developed extensive experience in underground mining, being advanced into responsible positions in both the engineering and production fields. His experience included coal prospecting and evaluation of reserves, mine design and operation, plant layout and design, property evaluations and mine management.

Immediately prior to his employment with the Paul Weir Company he was employed by a nationally-known engineering and consulting firm working in the engineering, design and construction of coal mining installations. At this time he served as a Project Engineer with responsibilities from initial planning to final operation. During this employment he also represented his firm as coal consultant to a major steel company in India.

His further experience and assignments with the Paul Weir Company have been in the same areas of engineering and professional activities as those previously discussed.

He is a member of the American Institute of Mining, Metallurgical and Petroleum Engineers, and the Illinois Mining Institute.



GEORGE W. BOULTER

Mr. Boulter received his B.S. in Mining Engineering from Montana School of Mines, and is a Registered Professional Engineer.

His specialty is strip, open-pit and quarry mining, with world-wide experience on projects of major scope.

Earlier in his career he was employed as Mining Engineer and Mine Superintendent by major metal mining companies in western United States and later as Mining Engineer and Project Manager by a major western railway company. At the time he joined Weirco in the early part of 1968, he was Manager, Mining Division for a major manufacturer of heavy earth-moving equipment.

As an authority on open-pit or surface mining, Mr. Boulter has extensive experience with operations of this type under a wide variety of conditions and a broad spectrum of equipment applications. In addition to familiarity with most of the open-pit operations of size on the North American continent, he has carried out assignments on many projects abroad, in areas including Australia, Africa, the Middle East, Tasmania, New Zealand, Surinam, Guyana, New Guinea, India, Brazil, Sweden, United Kingdom and West Germany.

He has contributed articles connected with his specialty to various technical publications and is the author of the chapter on Cyclical Methods—Draglines in the Seely W. Mudd series authoritative book on surface mining. He is a member of the American Institute of Mining, Metallurgical and Petroleum Engineers; Illinois Mining Institute; and Northwest Mining Association.



GERALD C. CLARK

Mr. Clark received B.S. and M.S. degrees in Mining Engineering from West Virginia University. He is a Registered Professional Engineer.

He joined Paul Weir Company in 1963. Prior to that time he had been Chief Engineer for a coal company and was employed by the American Mining Congress as Mechanization Engineer at the time he came to Weirco.

His experience with operational problems, underground mining methods and equipment applications under a variety of conditions, and the economic aspects of mine development and operation provides the basis for his demonstrated capabilities and contributions to many of Weirco's most demanding projects.

He has contributed various articles to technical publications, and is a member of the American Institute of Mining, Metallurgical and Petroleum Engineers; the West Virginia Society of Professional Engineers; and the Illinois Mining Institute. He is also a member of Sigma Gamma Epsilon, honorary earth's science society.



MARTIAL P. CORRIVEAU

Martial Corriveau received his B.S. degree in Metallurgical Engineering from Michigan College of Mining and Technology, and his S.M. in Metallurgy from Massachusetts Institute of Technology. He also received a Professional Engineering degree of Metallurgical Engineer from Michigan College of Mining and Technology. He is a Registered Professional Engineer. He joined Paul Weir Company in 1968.

Mr. Corriveau's experience is extensive in the fields of mineral dressing and processing, coal and coke analysis and testing, preparation and quality control, and research. He has been employed as a metallurgist with U. S. Smelting, Refining and Mining Company; as a Research Engineer with Battelle Memorial Institute; as Research Assistant at Massachusetts Institute of Technology; and as Associate Research Professor at Virginia Polytechnic Institute.

He held the position of Preparation Engineer and Manager of Quality Control with a multiple-mine coal producing company, and prior to joining Weirco he was Technical Advisor and Director, Commercial Testing and Engineering Co., responsible for all company-wide technical aspects of analysis and testing of coal, coke and ore minerals, and establishment of a new Air and Water Pollution Department.

Mr. Corriveau is a member of the American Institute of Mining, Metallurgical and Petroleum Engineers. He is a member of the Coal Preparation Committee, American Mining Congress and the American Society for Testing Materials (ASTM) Committee on Coal and Coke. His honorary society memberships include Tau Beta Pi and Sigma Xi.



**RICHARD W. STOREY**

Mr. Storey received his B.S. in Civil Engineering from the University of Kentucky. He is a Registered Professional Engineer (Mining and Civil). He joined Paul Weir Company in 1967.

During his career, he has held responsible positions in the U.S.A. with substantial coal mining firms as Mining Engineer, Division Engineer and Chief Engineer. Prior to joining Weirco he was employed on overseas assignment as Mining Engineer and advisor to the Korean coal industry on problems including exploration, development, operation, and processing and utilization.

His assignments with Paul Weir Company have been focused in the areas of feasibility studies, planning and design, mine operation problems and development of mining properties.

He has contributed articles to technical journals on underground sugar mining and continuous mining in eastern Kentucky coal fields. He is a member of the American Institute of Mining, Metallurgical and Petroleum Engineers, and the Illinois Mining Institute.



**JAMES E. McNULTY, JR.**

Mr. McNulty received his B.S. in Geology from the University of Iowa. He joined Paul Weir Company in 1961.

He is a mining geologist and has had intensive field and office experience in exploration and supervision of drilling and sampling programs, interpretation of exploration, drilling and analytical data, mapping, evaluation of underground mining conditions, and establishment of reserves.

He is a member of the American Institute of Mining, Metallurgical and Petroleum Engineers, and the Illinois Mining Institute.



**WILLIAM A. SMITH**

Mr. Smith received his B.S. degree in Mining Engineering from the Royal College of Science and Technology (Glasgow). He is a Chartered Engineer (U.K.).

He joined Paul Weir Company in 1966. His areas of special capabilities are shaft sinking and underground development work.

Mr. Smith has had extensive experience throughout Great Britain where he served as Project Manager for Cementation Company Ltd. His work also took him to India on major shaft sinking and mine development projects. Prior to joining Weirco he had been assigned to U.S.A. as Area Manager in charge of shaft-sinking projects for Cementation Company.

He is an Associate Member of the Institute of Mining Engineers (U.K.); a member of the National Association of Colliery Managers; the American Institute of Mining, Metallurgical and Petroleum Engineers; and the Illinois Mining Institute.



**JOHN S. SNYDER**

*Comptroller*

Mr. Snyder received his M.B.A. from the University of Chicago. He has been with Paul Weir Company since 1952.

Prior to joining Weirco, his experience included positions as District Controller for a multi-company engineering and heavy equipment manufacturing corporation and Comptroller for an electronic components manufacturing firm. He has had administrative responsibilities in mining operations.

His responsibilities with Weirco encompass all financial aspects of the organization including those connected with overseas operations. Purchasing, office personnel and office administration are under his supervision.

On projects involving economic and financial analyses and projections, Mr. Snyder's services are employed on behalf of clients as well as on Weirco's internal affairs.

He is a member of the Illinois Mining Institute.



JOHN L. DOBELBOWER

Mr. Dobelbower is a Mechanical Engineer, receiving his B.S. degree from Pennsylvania State University. He joined Paul Weir Company in 1964.

Prior to joining Weirco he had 14 years experience with a prominent company in the cement, lime and construction aggregate industry. Advancing from Mine and Plant Engineer, he held increasingly responsible positions as Project Manager, Budget Director and Manager of Operations in various divisions of the company. His experience included all phases of engineering, production, planning, operations and management. He has had direct experience on both engineering and operational levels with a wide variety of equipment used in underground and surface mining operations.

Mr. Dobelbower's experience and capabilities earned him an assignment as Project Manager of a team of Weirco engineers resident in Turkey as engineering consultants to the Turkish Government on a large scale expansion phase of the public sector coal mining activities. In addition to the supervisory responsibilities of a Project Manager, his work since joining Weirco has centered around planning, budgeting, and problems related to the engineering and application of equipment for mining and mining facilities.



HENRY D. OLSON

Mr. Olson is an Electrical Engineer, with a B.S. degree from the University of Minnesota. He joined Paul Weir Company in 1967.

Prior to his employment by Weirco, he had first served as a Field Service Engineer with the Electro-Motive Division of General Motors Corporation.

Later employed by Western Knapp Engineering Division of Arthur G. McKee and Company, he served as Electrical Design Engineer, provided field engineering services during construction and start-up phases of large industrial plants and facilities, and was Project Electrical Engineer on a multi-million dollar plant expansion.

Mr. Olson served with Jones and Laughlin Steel Corp. as Chief Electrician, New York Ore Division, engaged in the mining and beneficiation of iron ore. In charge of a staff of 27 electricians and their supervisors, he was responsible for all electrical design and construction, and the maintenance of all electrical equipment used in the mining operations. This included incoming 115KV lines through to the AC and DC machinery.

Upon joining Weirco, Mr. Olson was assigned to a major project in Turkey as Electrical Engineer on a Weirco team providing engineering services to the Turkish Government on a large scale mining expansion program. His activities with Weirco have continued to center around the engineering and technical problems related to electrical equipment, systems and facilities used in the mining industry.

He is a member of the Institute of Electrical and Electronic Engineers.



PAUL WEIR COMPANY

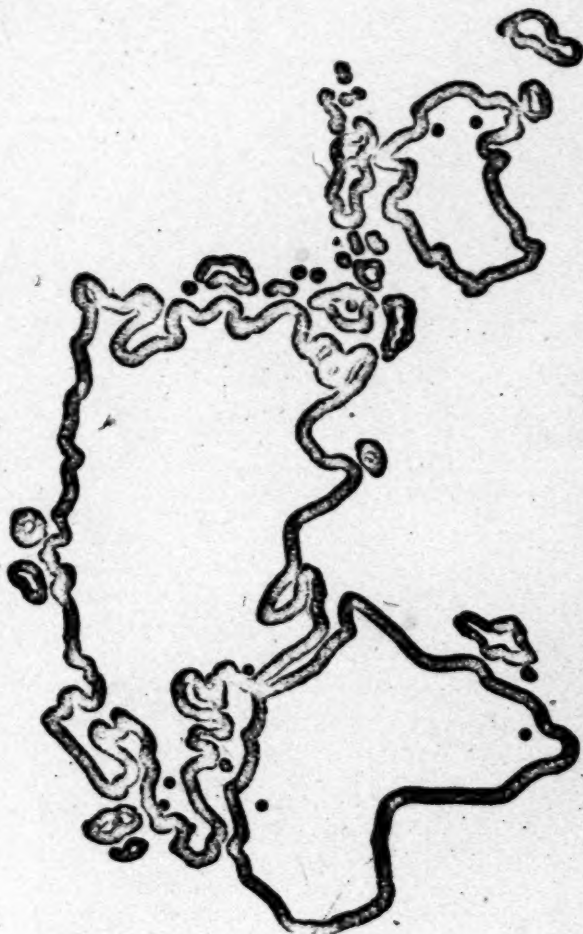
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# DOMESTIC AND OVERSEAS OPERATIONS

1876



- Canada
- Mexico
- Brazil
- Colombia
- Chile
- Middle East
- Indonesia
- South Vietnam
- South Korea
- Philippines
- Australia
- Great Britain
- Portugal
- Turkey
- Germany
- France
- South Africa
- North Africa